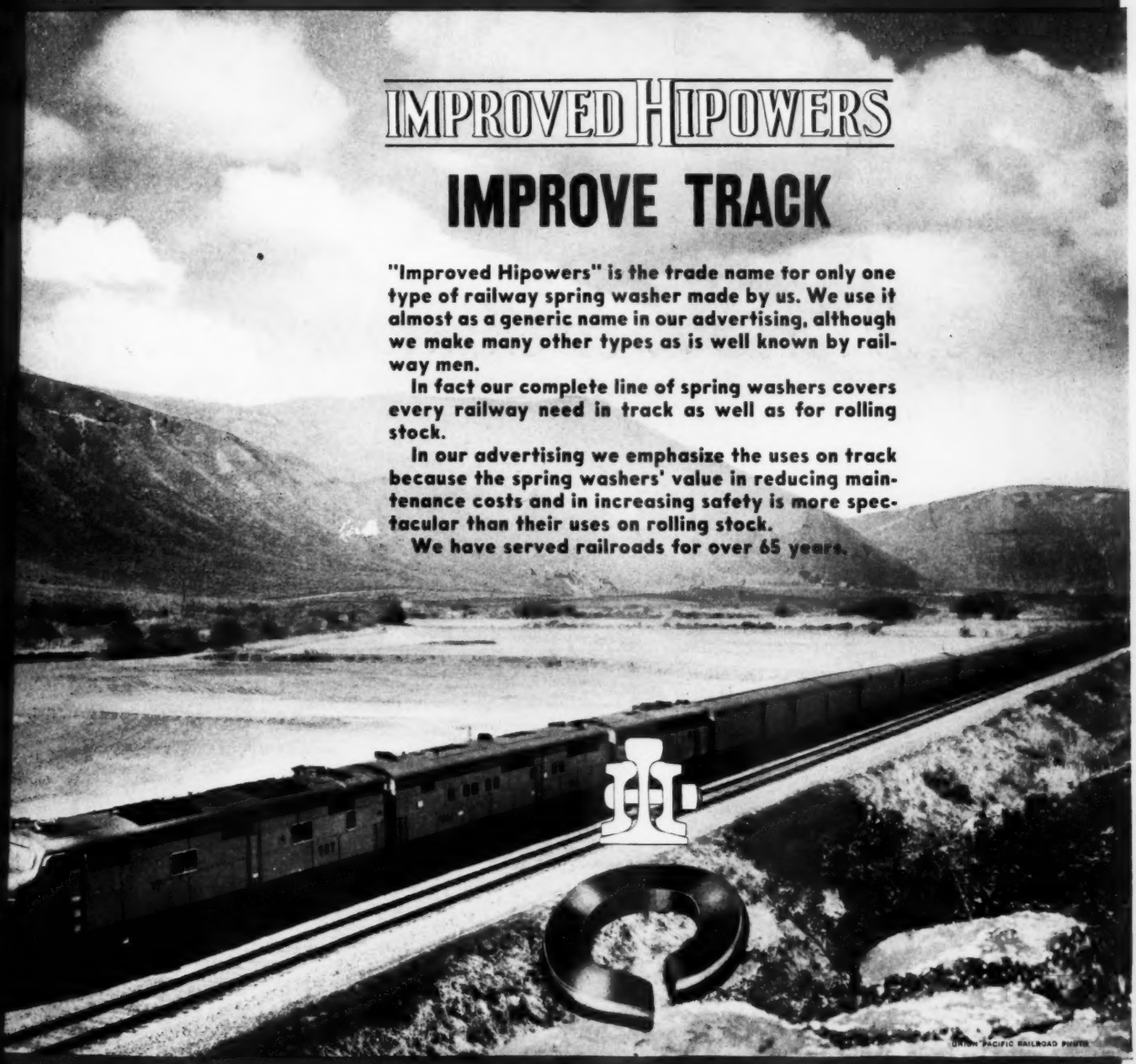
NOVEMBER, 1952

Railway Engineering and Maintenance



NATIONAL LOCK WASHER COMPANY, NEWARK 5, N. J., U. S. A.

A COMPLETE LINE OF RAILWAY SPRING WASHERS

CHECK THESE "800" HIGHLIGHTS YOURSELF...

- **EXCEPTIONAL VERSATILITY**... from welding and cutting to descaling and flame cleaning, hardening, and hardfacing.
- **WIDE TIP RANGE**... long flame or bulbous up to size 10. In separable swaged tips—up to size 13.
- **LOWER OPERATOR FATIGUE**...10 inches long; 21 ounce weight; planned balance minimizes operator fatigue.
- **FOR METAL CUTTING, TOO**...quickly converted for cutting either thin sheets or heavy plate up to 5-6" thick.

Ask for Catalog 2, Hand Torches for Welding and Cutting.

The Airco No. 800 Torch—with wider welding range than any other torch on the market—is ready for any job from car side sheets to main frames. Its weld-and-cut versatility makes it a natural for shop or along-the-track field work where a torch must withstand a lot of rough handling.

AND...the Airco 8400 series two-stage regulator... your guarantee of constant gas pressure. One pressure setting needs no further attention. Saves time, gas, with trouble-free operation—gives better flame performance in welding and cutting. Ask for Catalog 5, Regulators.

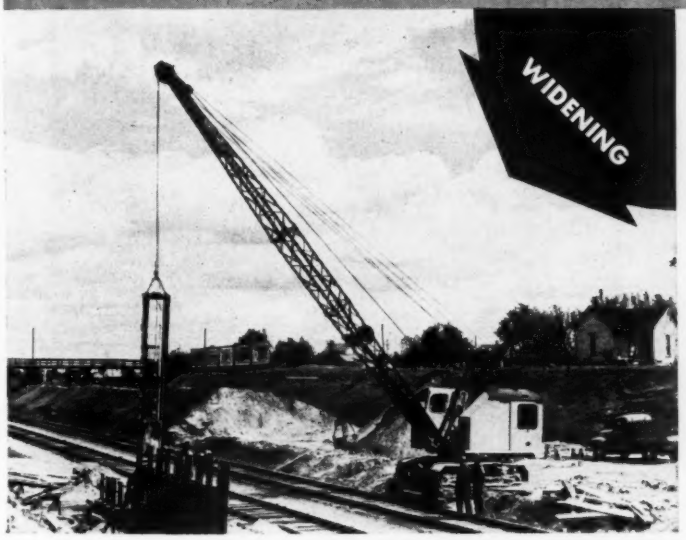
SUPPLIES, TOO...To complete the team for all around shop or maintenance-of-way welding, Airco offers a number of gas welding rods and electrodes, especially tailored for railroad service. You'll find them described in Catalog 12, Supplies. Ask for your copy today.

AIRCO® **AIR REDUCTION**

AIR REDUCTION SALES COMPANY • AIR REDUCTION MAGNOLIA COMPANY
AIR REDUCTION PACIFIC COMPANY
REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL
Divisions of Air Reduction Company, Incorporated
Offices in Principal Cities

at the frontiers of progress you'll find

Does things a Track Type Machine can't do



YOUR crawler rigs will pay for themselves by their very versatility. Load them and work from a standard flat car (they can be loaded or unloaded under their own power) or work along the line from the ground and take care of those off-the-line jobs a track type rig can't get to.

Versatility keeps a machine busy all the time. As soon as it is through with today's job it's ready for tomorrow's and a trailer will put it there even if it's well off the line.

Northwests have been proved on the leading railroads of the country on all classes of work. Their simplicity of design, their unusual advantages for ease of upkeep and operation make them low in operating cost and fast on the job.

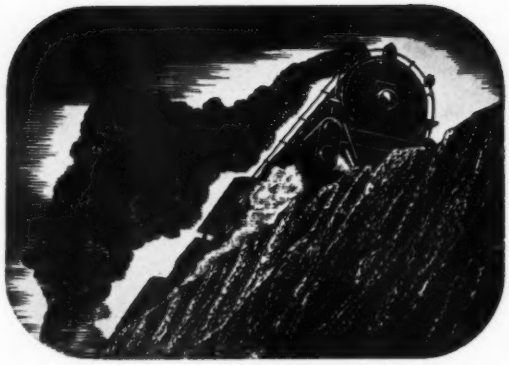
If you have bank to trim, widening to do, rail to handle, drainage work to do, bridges to build, aggregate to handle, short line or siding construction, storeyard work, shoulders to build out—if you have any lifting or digging to do a Northwest will save you money and get the job done faster. Why not lay plans now for a Northwest on your division?

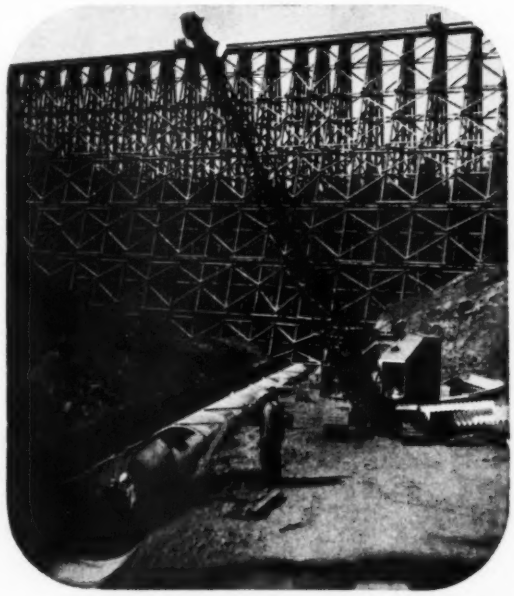
NORTHWEST ENGINEERING COMPANY
1513 Field Bldg.
135 South La Salle Street
Chicago 3, Illinois

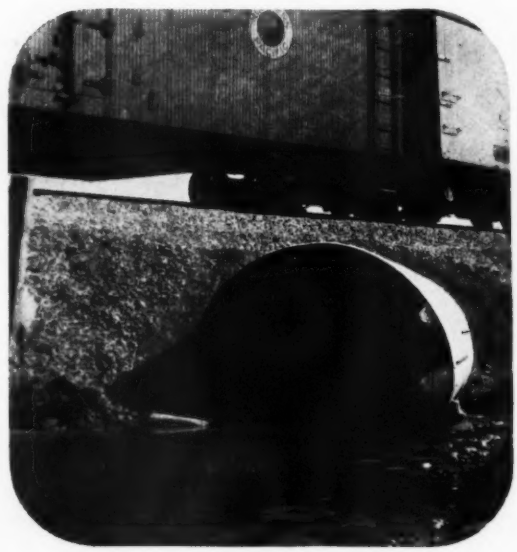
NORTHWEST

THE ALL PURPOSE RAILROAD MACHINE
SHOVEL • CRANE • DRAGLINE • PULLSHOVEL

These drainage structures and locomotives have something in common







You use switchers, passenger and freight locomotives because each is best for a specific job. Armco Drainage Structures are also designed to do specific jobs efficiently and economically.

Armco Structures have the flexible strength of corrugated metal design. They are easy to install and assure long, dependable service. There is a type to meet every drainage problem. Standard, round corrugated metal pipe is ideal for smaller drainage structures; where headroom is limited Armco PIPE-ARCH provides efficient drainage; and Armco MULTI-PLATE Pipe and PIPE-ARCH extend the advantages of corrugated metal design into the larger sizes.

You also select the material durability best suited to service conditions. Plain Galvanized Armco Structures give long, economical service under normal conditions. Additional protection is obtained by adding a bituminous coating. Where severe corrosion is a problem there is Armco ASBESTOS-BONDED and for erosion Armco PAVED-INVERT offers utmost protection. Armco Structures are available in a wide range of sizes to meet your specific needs.

Use railroad-proved Armco Drainage Structures for dependability and economy. Write for complete information. Armco Drainage & Metal Products, Inc., 2982 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.

ARMCO

ARMCO DRAINAGE STRUCTURES

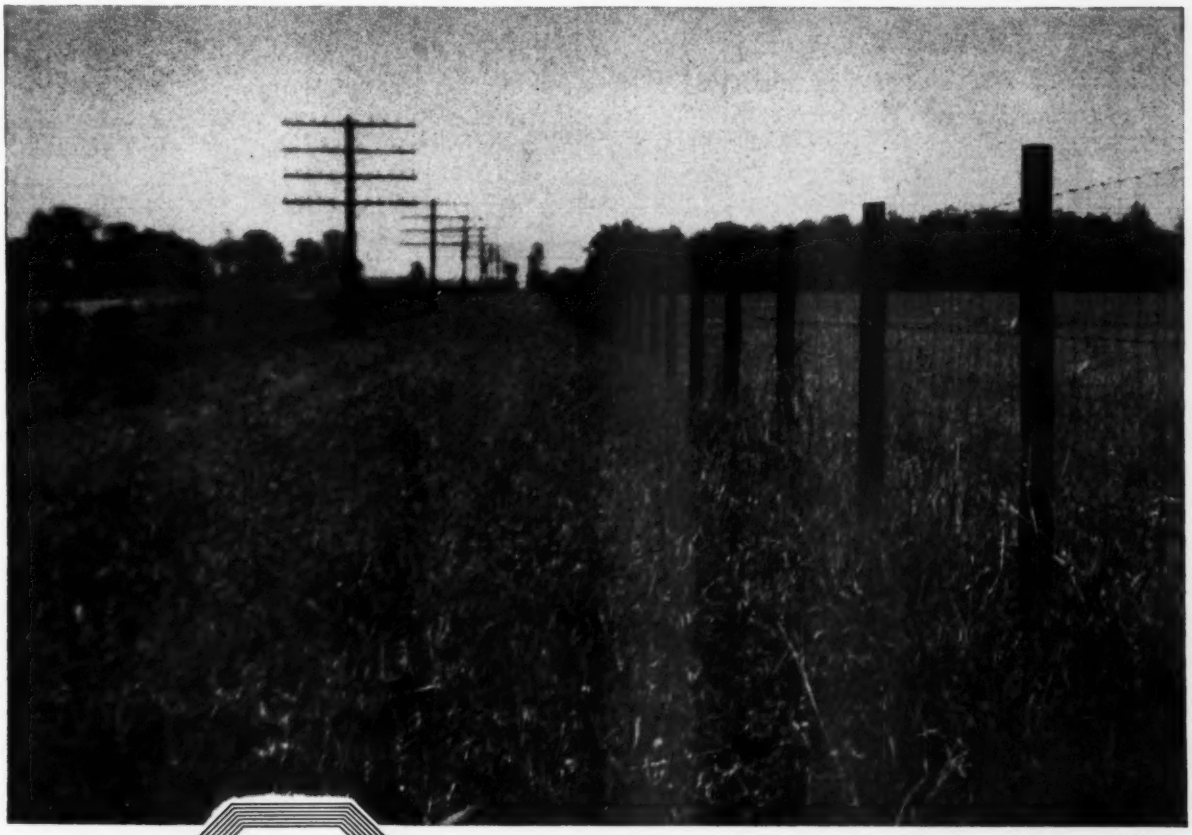
C & O cuts fencing costs

with Koppers Pressure-Creosoted Posts

To cut non-productive costs, in 1925 the Chesapeake & Ohio Railway began a test of posts for fencing. Carefully recorded installations were made of every kind of post that was considered usable. Treated and untreated wood of a number of species, as well as steel posts, were included. The results of the test were reported before the American Wood Preservers' Association in April this year.

By 1949, it had been clearly demonstrated that sizeable economies would result from the use of pressure-creosoted wood posts. Such posts set in 1925, not only were in service in 1949, but looked as though they would serve another twenty years. None of the other posts approached this performance. *On the basis of its own tests,* C & O then instituted a program of fencing with Koppers pressure-creosoted posts—more than 30,000 up to May, 1952.

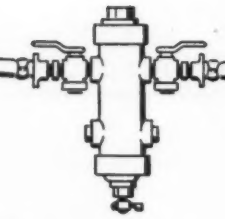
If you want the facts on the economy of pressure-creosoted posts, they are contained in C & O's report to AWPA. We'll be glad to send you a copy of this report or supply additional information.



C & O right-of-way fencing near Richmond, Va.

KOPPERS PRESSURE-TREATED WOOD

KOPPERS COMPANY, INC. • Pittsburgh 19, Pa.



All Air Lines Lead to Savings

WHEN YOU USE

GARDNER-DENVER

PORTABLES AND AIR TOOLS

To Speed Your Work

Fast Drilling— with Gardner-Denver Sinkers. Outstanding drillers in every weight class. Exceptional hole cleaning ability.

Economical Breaking — with Gardner - Denver Paving Breakers. A size for every type of work. Safety latch. Built-in lubricator.

Solid Tamping—with Gardner-Denver Backfill Tampers. Smooth walking. Non-freezing exhaust. Easy to maintain.

Full Air Capacity — at any altitude — with the Gardner-Denver Two-Stage WH-105 Gasoline Powered Portable. Fully water-cooled cylinders for dependable operation, regardless of weather or temperature extremes.

Write today for full information on Gardner-Denver Water-Cooled Portables and Gardner-Denver Air Tools.

Powerful Driving— with Gardner-Denver Sheeting Drivers. Adjustable jaws. Safety latch. Removable foot rests.

Dependable Pumping — with the VP4 Pneumatic Sump Pump. Top-suction prevents clogging —protects motor and bearings from mud.

Easy Digging— with Gardner-Denver Clay Diggers. Made of special steel for extra strength. Quickly converted to Trench Digger.

SINCE 1859

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Gardner-Denver Company, Quincy, Illinois

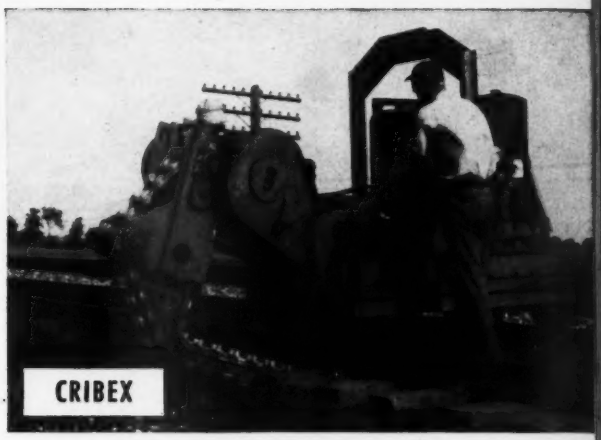
In Canada: Gardner-Denver Company (Canada), Ltd., Toronto, Ontario

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

For additional information, use postcard, pages 1112A-1112B

YOU CAN'T BEAT THESE
NORDBERG
BALLAST RECONDITIONING MACHINES

FOR SPEED ECONOMY AND VERSATILITY



CRIBEX®

Removes material contained in the cribs and deposits it beyond the ends of the ties. Leaves a smooth, uniformly-graded tie floor, completely emptying the crib without damage to ties or rail. **Proved in use in excavating over 3,500,000 cribs.**

BALLASTEX®

Excavates ballast in the area between the tracks or in the shoulder and disposes it by either wasting to the side or feeding it to the SCREENEX for cleaning. Digs a uniform trench 42-in. wide, or any desired depth to a maximum of 30-in. below top of rail.

SCREENEX®

Takes fouled, excavated ballast from BALLASTEX, passes this material over a vibrating Symons Rod Deck Screen and returns cleaned ballast to the track, intertrack, or shoulder in any desired proportions—wasting the screenings to the side beyond the shoulder.

● With these three outstanding Nordberg machines, you have a combination that can solve virtually *any* ballast reconditioning problem. And what's more . . . this versatile "threesome" will accomplish the job *faster* and at *less* cost.

The speed, economy and versatility of the CRIBEX . . . BALLASTEX . . . SCREENEX trio has been amply proved in service in every kind of ballast. Let us show you how these modern ballast reconditioning machines can save time and money for *you*.

USE NORDBERG "Mechanical Muscles"* TO DO A BETTER, FASTER MAINTENANCE JOB AT LOWER COST . . .
*Copyright 1952, Nordberg Mfg. Co.

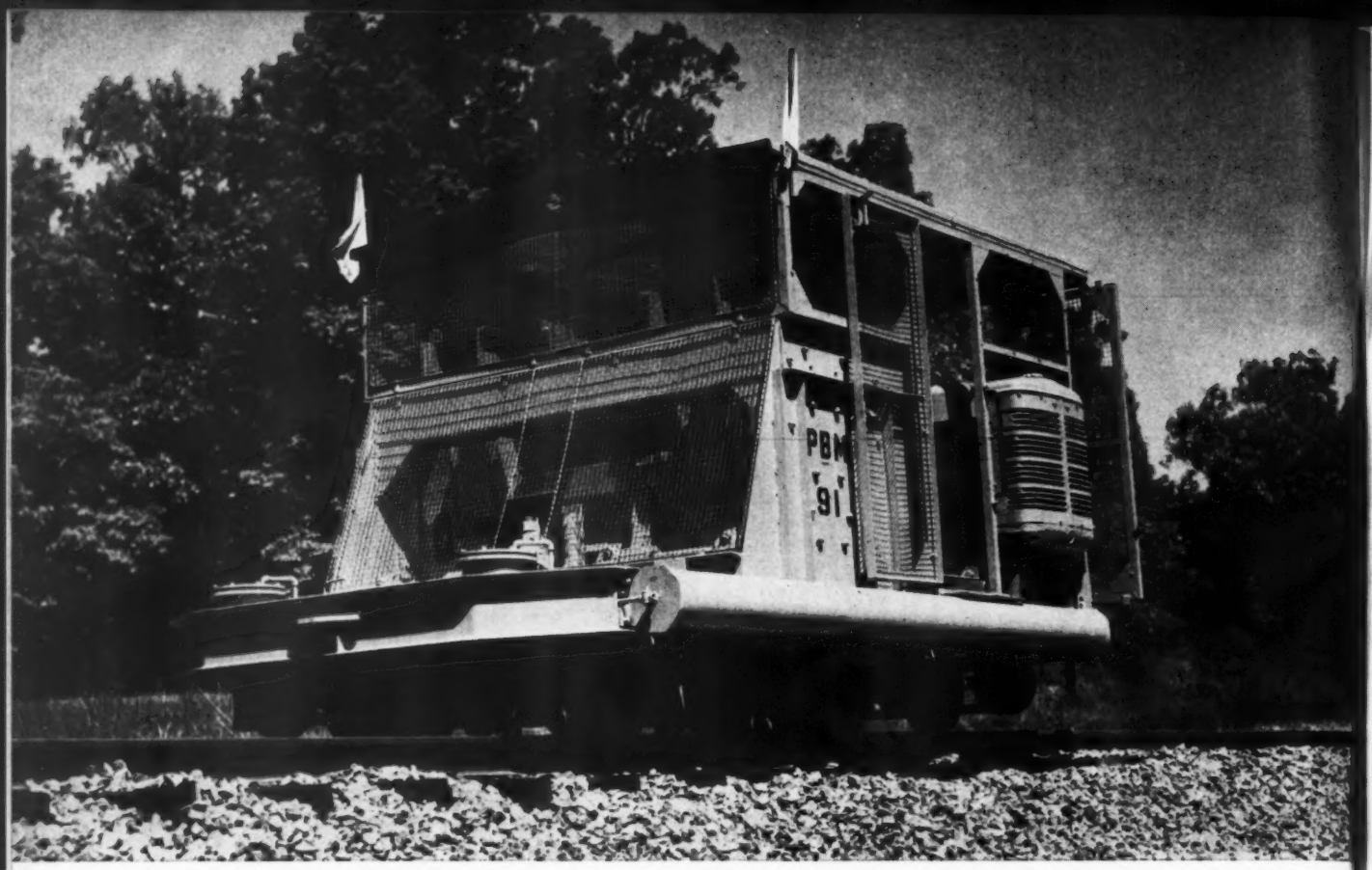
For full details, send for a copy of BULLETIN 174.

R-751R

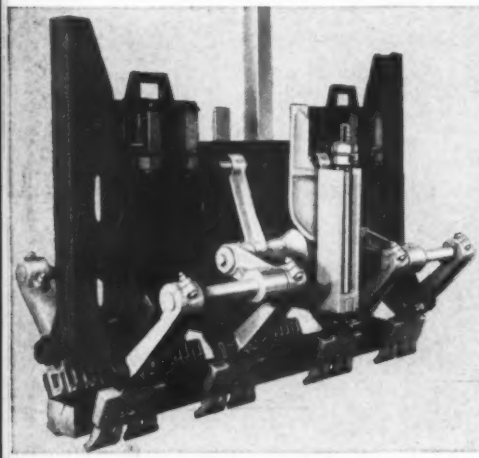
ADZING MACHINE • CRIBEX® • BALLASTEX® • SCREENEX® • GANDY • DUN-RITE GAGING MACHINE • POWER JACK • POWER WRENCH • RAIL DRILL • RAIL GRINDERS • SPIKE PULLER • TRAKGAGER • TRACK SHIFTER • DSL YARD CLEANER

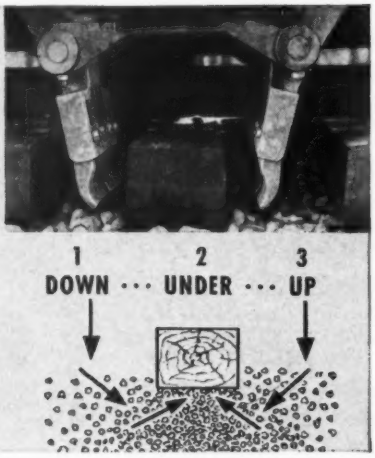
NORDBERG MFG. CO., *Milwaukee, Wis.*

NORDBERG MACHINERY



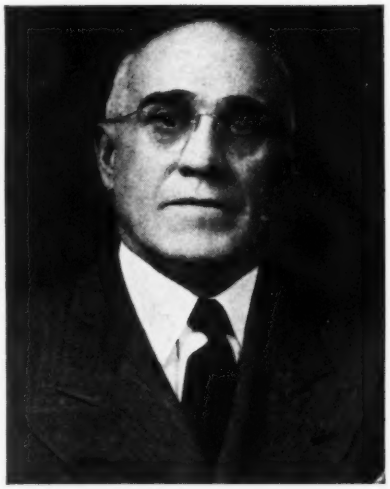
The Monon found of great importance the fact that the Power Ballaster's high running speed of 25 mph enables it to run into the "hole" and come back to job locations quickly, thus minimizing the effect of traffic interruptions on production output on the Monon's predominately single track territory. This high running speed and the Monon's pioneering in combining two or three five-man section gangs to provide its Power Ballaster's complete labor complement, also permit the Monon to tamp where it is most needed—even though the work locations may be separated geographically. For instance, the Monon has run its Power Ballaster as much as 62 miles between two work-job locations and still produced 2000 feet of finished tamped track within a single work-day period.





Seven reasons why the Power Ballaster produces better quality, longer lasting track: 1. Exclusive cam and tamping bar design combine to produce triple-action ballast compaction; 2. tamping bars squarely address the tie, facing each other to uniformly compact a squared ballast foundation; 3. free-falling head applies tamping force equally to all bar positions providing uniform compaction; 4. 32 tamping bar positions produce the proper compaction on each side of and under rail; 5. a readily made adjustment regulates the depth of application of tamping force; 6. five types and sizes of interchangeable tamping bars to meet any raise or ballast specification, and 7. linkage system progressively increases force applied to each tamping bar producing maximum under-tie compaction.

Above: Photo and sketch show how these exclusive design features combine to enable the Power Ballaster to tamp in strict accordance with the time-tested standards and methods established for production tampers by the A. R. E. A.



Mr. L. F. Racine, Chief Engineer of the Monon, tells about the excellent service this railroad received from Pullman-Standard and the superior performance of the Power Ballaster. (See next page.)

SUBSIDIARY OF

ROAD & TRACK EQUIPMENT DIVISION **PULLMAN**

BIRMINGHAM • PITTSBURGH • NEW YORK • WASHINGTON • SAN FRANCISCO • 79 EAST ADAMS STREET

Service for the Monon

The good performance of the Power Ballaster and the good service behind it work together to serve you better. The Monon has one Power Ballaster in operation, but prompt field service and the fact that the machine can be returned to Pullman-Standard for annual overhaul enable this production tamper to be *always* on the job. Last year, for all railroads the Power Ballaster's availability was 96.6 per cent of all work season time.

matches the "Pullman" standard

But readily available factory service does not by itself guarantee quality results. Equipment performance and methods must also be right. Power Ballaster performance does assure faster, lower-cost tamping jobs fully meeting A. R. E. A. specifications. Further, this machine is built so ruggedly that the necessity for service is minimized and its design is such that its one operator can readily make minor repairs and adjustments at the work location. Not only are savings effected by the Power Ballaster's one-operator requirement, but its exclusive operating features reduce crew requirements to as few as 10 to 15 men while maintaining a production rate of 500 to 700 feet of finished tamped track per hour.

# of Power Ballaster performance

For Pullman-Standard service, for more feet of finished tamped track an hour, for lower labor and maintenance requirements—the Power Ballaster's *established records* are unequalled by any production tamper available today.

And you can prove it while tamping your own ballast. Choose one of these four ways: (1) outright purchase; (2) rental for ninety days, with option to buy; (3) straight rental for a minimum period of three months; (4) deferred quarterly payments over a period of 1 to 3 years. The rentals and deferred payments are established at substantially less than the realizable savings accruing during the payment periods.

MONON THE HOOSIER LINE "Best of all was the good service we got from Pullman-Standard's people. We arranged for annual overhaul of our Power Ballaster at the Pullman plant. When our operator was called into the Army, Pullman quickly trained a new one for us at their factory. Because we have only one Power Ballaster in operation, we require high availability and top-flight service. Since the Power Ballaster's running speed is 25 mph, we have found that it is practicable to use the Power Ballasters for short and geographically separated jobs. This production tamper has fulfilled our need for low-cost, high quality track and given us great flexibility in our track maintenance operations."

Here's what YOU get from the POWER BALLASTER:

- Longer Lasting Track
- More Production—Lower Labor Requirement
- Long Equipment Life
- Maximum Use of Track Time
- Easy Operation and Maintenance
- Universal Application—Versatile Production

Your Assurance: PULLMAN-STANDARD has been one of the great U. S. railroad equipment suppliers for 73 years; its time proven integrity and reliability are behind the POWER BALLASTER to protect your equipment investment and to assure a factory stand-by of spare parts and continuing factory service.

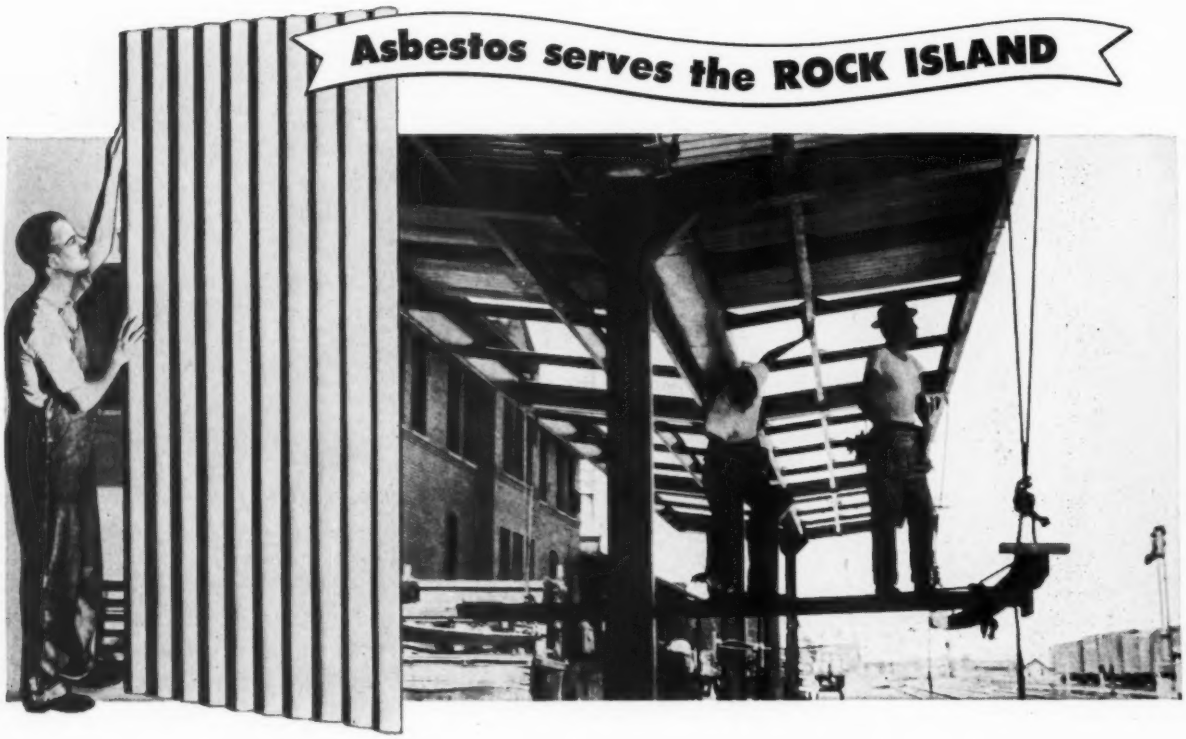
Write for Booklet containing complete detailed engineering data and operating facts about the POWER BALLASTER.

You are cordially invited to visit the Pullman-Standard Industrial Showroom when in Chicago.

PULLMAN INCORPORATED

PULLMAN-STANDARD CAR MANUFACTURING COMPANY

CHICAGO 3, ILL. • THE HOLDEN CO., LTD., MONCTON • MONTREAL • TORONTO • WINNIPEG • VANCOUVER



Fireproof and weatherproof walls and roofs *built quickly and economically with*

J-M Corrugated Transite*

ON RAILROAD AFTER RAILROAD across the country, Corrugated Transite is used for many types of construction, large and small, because of its versatility, its economy, and its ability to *last for years* without maintenance.

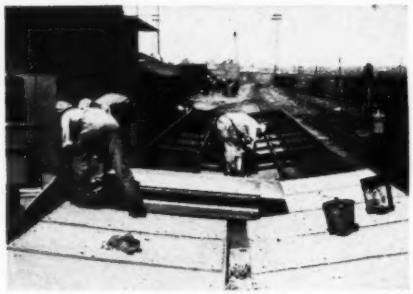
It is versatile because it can be used for roofing or siding on all types of construction—from a right-of-way building to a diesel shed or freight terminal. It is an architecturally attractive material that can be used with outstanding effect in conjunction with other materials, such as glass block, glass panes, or clay brick.

It is economical because it comes in large sheets that are easy to handle, and cover large areas with minimum framing. And, because it is virtually maintenance-free, it never requires painting or other treatment for preservation.

It will provide years and years of service, because this Transite pressure-moulded, asbestos-cement material is fireproof, corrosion-proof, weatherproof, and rotproof.

For more information write Johns-Manville, Box 60, New York 16, N. Y. In Canada: 199 Bay Street, Toronto 1, Ontario.

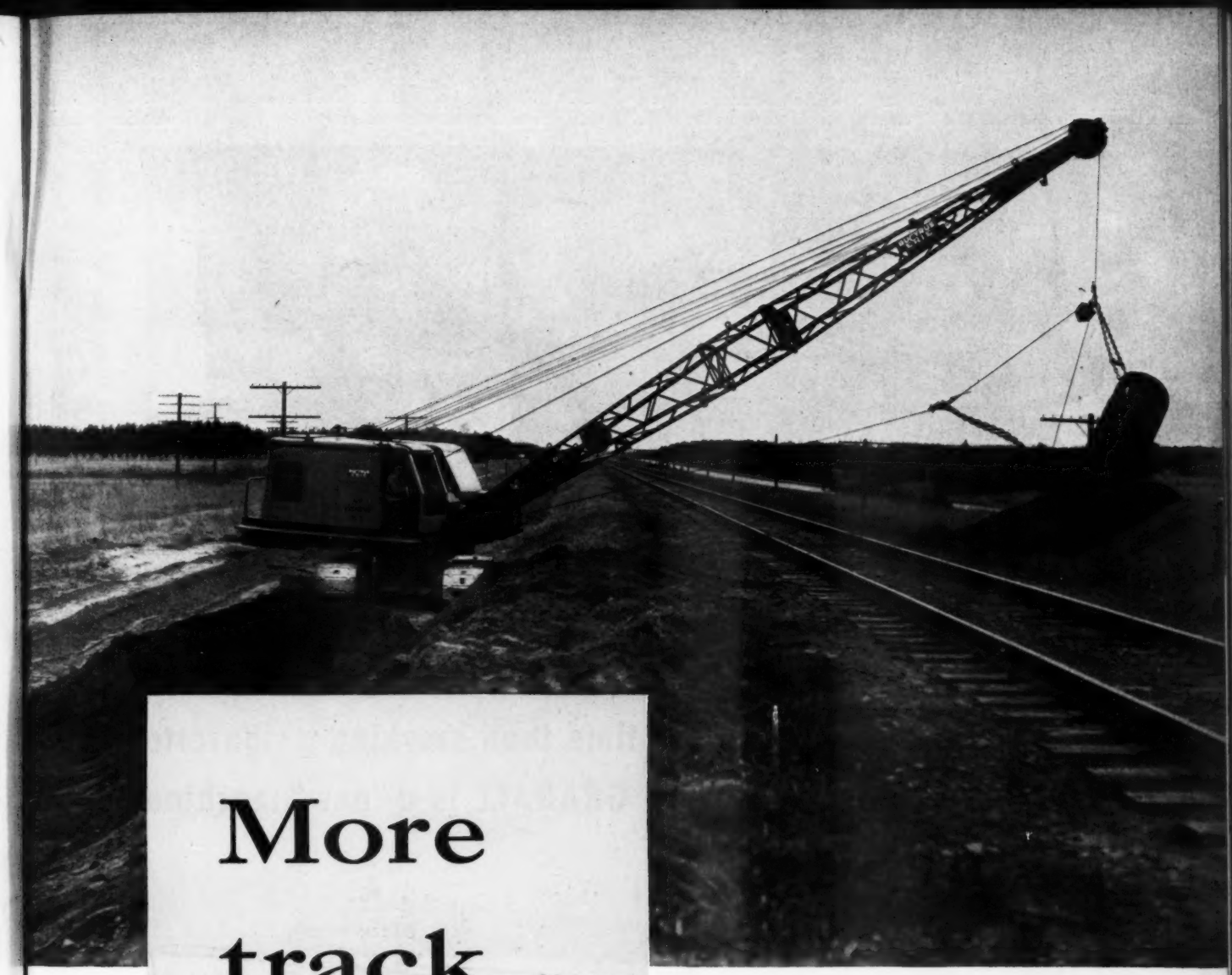
*Transite is a registered Johns-Manville trade mark.



This new Corrugated Transite train shed at Rock Island, Ill., was built to replace a wooden-roofed shed. Corrugated Transite was used for roofing. Note how the large sheets of Corrugated Transite are applied directly to the steel framing.

JOHNS-MANVILLE JM PRODUCTS **Johns-Manville**

94 YEARS OF SERVICE TO TRANSPORTATION



More track

for the Northern Pacific

This Bucyrus-Erie 38B Dragline is helping to extend a Northern Pacific passing track near Willow River, Minn. Its 1½-yd. bucket makes that long swing over the roadbed every 22 seconds, handling about 1,400 yds. of sandy clay and gravel in an average 8-hour day. Power for the job is furnished by a "Caterpillar" D13000 Diesel Engine.

The Northern Pacific owns a lot of "Cat" off-track equipment, so they knew what to expect from this engine: dependability on tough jobs, economy, simple operation. Take the fuel system, for example. There's not a single operating adjustment required. And its pre-combustion chambers and single orifice injection valves let you run your "Caterpillar" Engine thousands of hours on regular fuel without fouling or clogging.

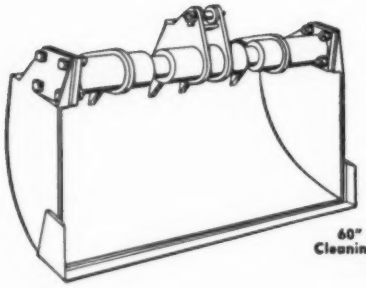
There's a complete range of "Caterpillar" Engines up to 500 HP, for off-track and motive power. These engines are available in machines built by the leading equipment manufacturers. You'll get better performance at lower cost with years of added service if you specify "Caterpillar" power in the equipment you buy.

CATERPILLAR, PEORIA, ILLINOIS

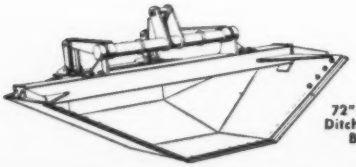
CATERPILLAR

REG. U. S. PAT. OFF.

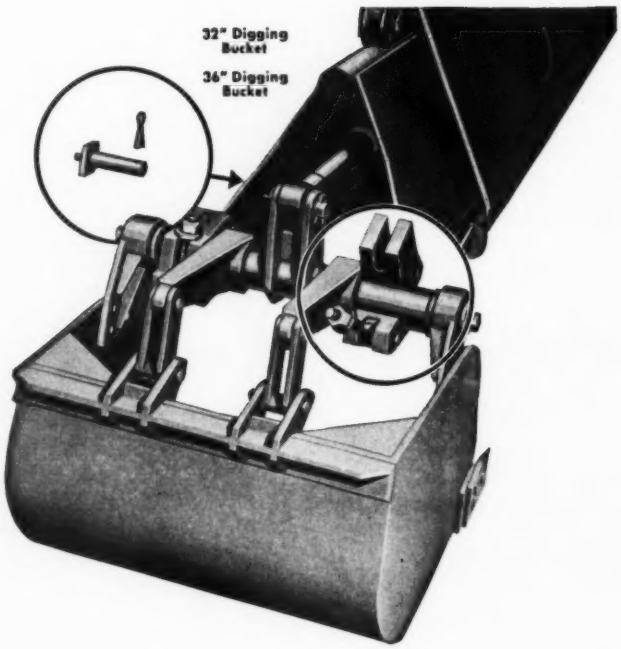
Railroad Diesels



60" Ditch Cleaning Bucket



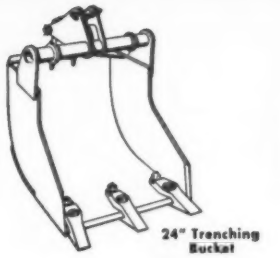
72" Formed Ditch Digging Bucket



32" Digging Bucket

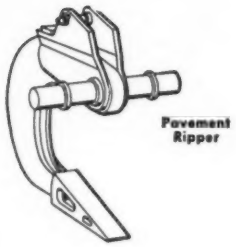
36" Digging Bucket

In less time than smoking a cigarette ...your GRADALL is a "new" machine

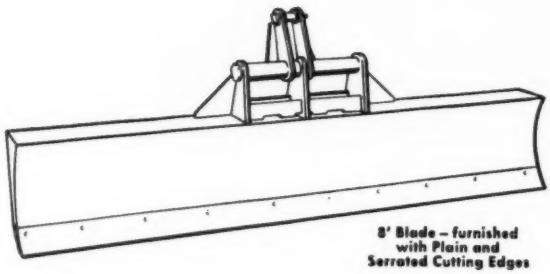


24" Trenching Bucket

15" Self-cleaning Bucket for Wall Footings



Pavement Ripper



8' Blade – furnished with Plain and Serrated Cutting Edges

NOW YOU CAN REPLACE several specialized maintenance and construction machines, and practically all clean-up hand labor, with one versatile machine – the Gradall.

Shown are some of the wide variety of tools for the many specialized jobs performed by the Gradall. All can be carried right on the Gradall. And because they can be quickly interchanged, in a matter of minutes you can have a "new" machine for the job at hand – whether it's cleaning roadbeds, trenching, excavating, backfilling, ditch cleaning, grading, or removing pavement.

This will give you an idea of the many kinds of jobs on which the Gradall can cut maintenance and construction costs for you. For all the facts, and a field demonstration, contact your Gradall Distributor.

Gradall Distributors in over 75 principal cities in the United States and Canada

Gradall
DIVISION OF WARNER & SWASEY Cleveland

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

Steel strapping service like this prevents shipping damage

HERE Cliff Onthank, Brainard salesman in Grand Rapids, shows a customer's shipping man how to apply the Brainard Strapping System to make a "floating load" shipment in a boxcar. By strapping all the cartons in a shipment together, the entire load can shift as a unit during impact, and thus avoid damage.

The proper application of steel strapping is just as important as the strapping itself . . . that's why *demonstration* is a key part of Cliff Onthank's job. Like his fellow Brainard salesmen, he has the experience and know-how to give you all-round good service.

To improve your shipping and materials-handling operations, give your problems to your Brainard salesman . . . offices located throughout the U.S. In Canada, P. J. McArthur Company, Toronto.

COMPLETE STEEL STRAPPING SYSTEM, ENGINEERING, STEEL STRAPPING, TOOLS AND ACCESSORIES, ANTI-CHECKING IRONS

Brainard
SHARONSTEEL
STEEL DIVISION
SHARON STEEL CORPORATION

WARREN, OHIO

For illustrated catalog write Brainard Steel Division, Sharon Steel Corporation, Dept. S-11, Griswold Street, Warren, Ohio.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PASADENA, TEX.
Economical
WEED CONTROL SERVICE
Through Strategically Located Plants
Shown above are the eight Chipman Chemical Company weed killer plants in the United States . . . strategically located in major railroad centers to give you economical service, both in materials and application of chemicals. Also shown are plants operated by Chipman Chemicals, Ltd., the associate company in Canada. These plants afford economical, convenient servicing of Canadian lines.
Strategically located plants and a complete line of *proven* weed killing chemicals are two big reasons why you can get dependable, low cost weed control service . . . backed by 40 years of experience . . . from either of these two companies. Write today for further information and descriptive literature on the weed killers listed below.
ATLACIDE LIQUID & SPRAY POWDER • CHLORAX LIQUID & SPRAY POWDER
TCA-CHLORAX LIQUID • ATLAS "A" WEED KILLER • BRUSH KILLER
CHIPMAN
WEED Control SERVICE
CHIPMAN CHEMICAL CO.
Manufacturers of
Railroad Weed Killing Chemicals Since 1912

EMERGENCY SET-OFF BY ONE MAN

One man can quickly remove the Fairbanks-Morse Model 101 from the rails—even without a set-off.

Low lifting weight, balance, and guards between the wheels contribute to this vital safety advantage. Add features of immediate reverse, four-wheel brakes, grouped controls, full visibility—and you'll see why the Model 101 Motor Car has won such wide acclaim on railroads for safety.

For all maintenance, inspection and signaling service, look to the complete line of Fairbanks-Morse cars. You'll find the answer to safe, reliable transportation.

Fairbanks, Morse & Co., Chicago 5, Illinois.

FAIRBANKS-MORSE

a name worth remembering when you want the best

RAIL CARS • RAILROAD EQUIPMENT • PUMPS • SCALES • ELECTRICAL MACHINERY
DIESEL AND DUAL FUEL ENGINES • DIESEL LOCOMOTIVES • MAGNETOS

American Railroads... *a good example for industry!*

(This message appeared in the Wall Street Journal)

Regardless of rising costs, American Railroads keep a constant vigilance on the *quality* of their service. The comfort and safety of the public and the fast and safe shipment of goods *must* come first with the railroads.

So railroad presidents and management, *working closely with their chief engineers, are continuously improving standards,* adapting new techniques and modern machines.

For example: TODAY THERE IS A NEW CONCEPTION OF TRACK MAINTENANCE. *Most chief engineers approve it most heartily!* Progressive railroads have quickly adopted this new, *Matisa* standard of track maintenance—and *more* demands* are being made daily on *Matisa* to ensure better track for '53!

Manufacturers who follow the principle that *a firm is no better than its product* realize the value of maintaining high quality —just as railroads know that "*a railroad is no better than its track!*"

*Matisa's Sales Progress Report *proves that more and more railroad presidents are looking to their chief engineers for track maintenance equipment to ensure operating economy as well as quality. If you would like a copy of this report, write us.*

Matisa

EQUIPMENT CORPORATION

224 S. MICHIGAN BLVD. • CHICAGO 4

TRACKWORK SPECIALISTS ALL OVER THE WORLD

Congratulations to the Consolidated Railroad of Cuba

NEWS NOTES . . .

NOVEMBER, 1952

. . . a resumé of current events throughout the railroad world

Freight car loadings in the fourth quarter of 1952 are expected to be 1.4 per cent above those in the same period of 1951, according to estimates of the 13 regional Shippers' Advisory Boards. On the basis of these estimates, loadings of the 32 principal commodity groups will be 8,129,875 cars in the fourth quarter of 1952, compared with 8,015,328 actual loadings for the same commodities in the corresponding period last year.

•

Revenue passenger miles of the Class I roads for the first half of 1952 were up 3.9 per cent from the first half of last year. Passenger revenue was up 6.7 per cent—$459.4 million compared with $430.6 million. This data, presented by the Bureau of Transport Economics of the Interstate Commerce Commission, also revealed that freight revenue ton-miles were down 5.1 per cent from the total for the first half of 1951, while freight revenue was down only 0.1 per cent—$4,235 million as compared with $4,239 million.

•

Class I railroads in the first eight months this year had an estimated net income, after interest and rentals, of $405,000,000, according to the Bureau of Railway Economics of the Association of American Railroads. The 1952 figure compares with a net income of $339,000,000 for the first eight months last year. Net railway operating income in the eight-month period this year totaled $611,327,838, compared with $527,579,745 last year.

•

A closing date of December 15, 1952, has been set for the submission of railroad technical papers to be presented before the Eighth Pan American Railway Congress to be held in Washington, D. C., and Atlantic City, N. J., next June. Papers prepared by residents of the United States should be submitted in triplicate to Dr. Lewis K. Sillcox, vice-chairman of the board of the New York Air Brake Company, Watertown, N. Y.

•

The Baltimore & Ohio has launched a supervisory development program designed to teach the road's officers to be "better bosses." The first phase of the course includes training in human relations and is designed to acquaint the men with established methods of handling people. The entire course lasts 5 days and contains study groups of 12 officers each, who are relieved of all other duties during this training.

•

The Defense Production Administration has announced its allotments of controlled materials for the first quarter of 1953. The railroad equipment allotments made to the National Production Authority include 1,071,453 tons of steel, 86,300,000 pounds of copper, and 5,135,000 pounds of aluminum. The copper and aluminum quotas are the same as those made for the fourth quarter of 1952. The new steel allotment is 350,000 tons less than the 1952 fourth quarter allotment of 1,421,709 tons.

NEWS NOTES (continued)

Continued shortages of car building materials resulting from the steel strike in June and July sent September deliveries of new freight cars down to 3,762—lowest since July 1950—according to the American Railway Car Institute and the Association of American Railroads. This compares with total deliveries of 8,533 cars in September 1951. September 1952 orders for new freight cars totaled 3,628, bringing the backlog of cars on order to 95,377 as of October 1.

•

An open round-table discussion will be held in Chicago on November 24 and 25 to discuss all phases of the first report of the Transportation Association of America's Cooperative Project on National Transportation Policy.

•

Following its plan to relay all main line trackage with 132 lb. rail, the Louisville & Nashville recently ordered 69,750 net tons of rail, estimated to cost approximately $5,600,000. Orders for track fastenings were placed totaling an estimated $3,700,000.

•

Railroad employees working under agreements containing escalator clauses received an increase of two cents an hour October 1. Total raises effected by these provisions now amount to 14 cents per hour.

•

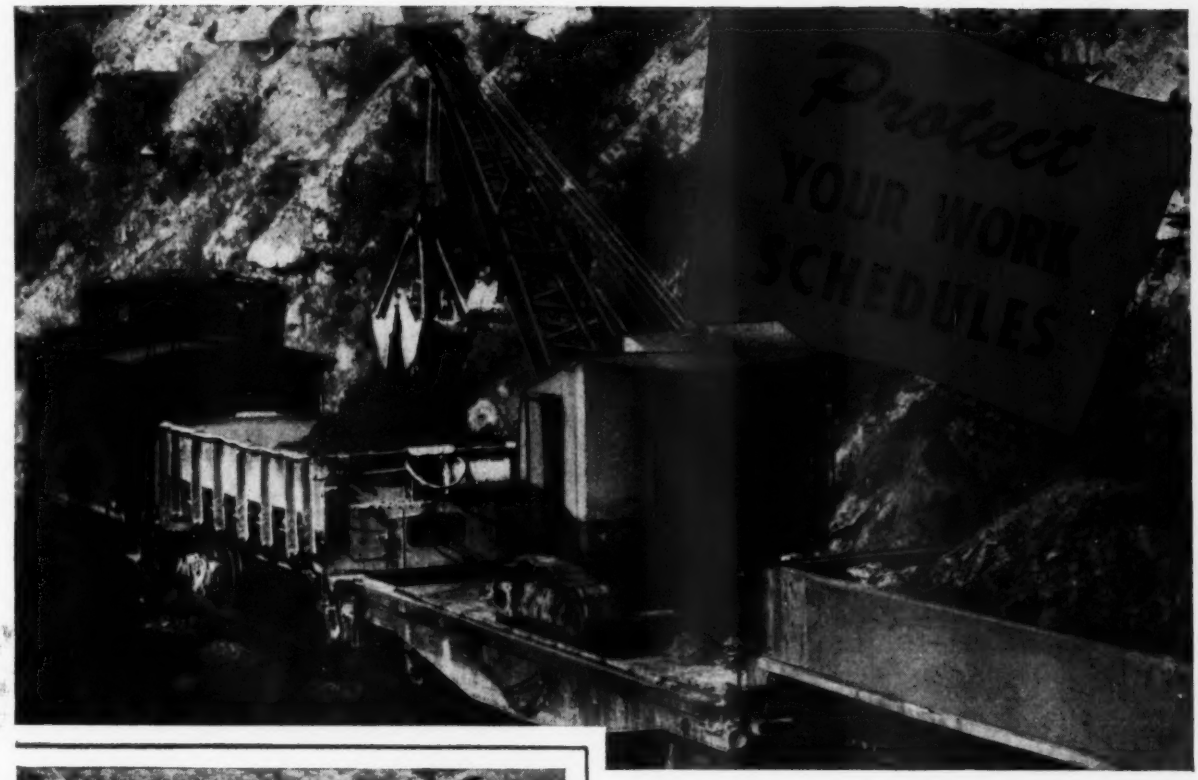
Production has begun on a motion picture tentatively entitled, "Once Upon the Wabash," which will portray the history and development of that road since its start 114 years ago, but which will concentrate on the railroad as it is today.

•

Member companies of the National Railway Appliances Association have been invited to participate in an exhibit to be sponsored by the Railway Supply Manufacturers Association at Atlantic City, N. J., June 21-27, 1953, in conjunction with the Eighth Pan American Railway Congress and the annual meetings of the Mechanical and Purchases and Stores Sections and the directors of the Association of American Railroads. The N.R.A.A. will not participate as an association, but the invitation has been passed on to individual members and it is understood that a number of them are giving serious consideration to it.

•

Also worth noting—Lynne L. White, president of the Nickel Plate, has been elected a member of the board of directors of the Association of American Railroads. . . . The Griffin Wheel Company, subsidiary of American Steel Foundries, plans to expand its pilot plant at Chicago to produce AAR type X-3 steel freight car wheels. A new plant will be built at Hyacinthe, Que., for the same purpose. . . . Richard W. Rogers resigned October 15 as director of the National Production Authority's Railroad Equipment Division. He has resumed his former position as chief mechanical officer of the Seaboard Air Line. . . . The Southern Pacific has ordered radio installations to equip 155 miles of line from Sacramento, Cal., to Sparks, Nev., over the Sierra Nevada mountains through Donner Pass.



SELF-PROPELLED RAILAID works both on and off-track, travels at 4 rail speeds up to 14.4 m.p.h. Crane loads and unloads itself on ramp-equipped prppulsion car in less than 10 minutes. It lifts 6.6 tons from car, 8¼ tons from ground . . . readily converts to clamshell, dragline, pile driver, ½-yard shovel or hoe. For more information, send for bulletin.

RAILROAD MUD-JACK® stabilizes track beds without interrupting rail traffic. Injection points are driven below ballast . . . hydraulic pump forces soil-cement slurry into weakened area . . . stabilizes existing material, leaves firm lasting sub-grade. You save on labor, cut maintenance costs, reduce "slow orders." Write for 8-page engineering booklet.

with KOEHRING *heavy-duty* 304

Operating from work train, or on independent off-track operation, the *reserve* strength and weight-stability of Koehring heavy-duty 304 protects work schedules against costly down time . . . and gives you a definite advantage in extra work capacity. With 13.9-ton lift on crawlers (25-tons on rubber) there's plenty of lift capacity for loading and unloading cars, scrap-handling and salvage around yards . . . placing girders, timbers and other materials on bridge construction and repairs. Heavy-duty 304 handles magnet crane, pile driver, clamshell and dragline buckets on a wide work range . . . readily converts to ¾-yard shovel or hoe for cutting down embankments, ditching, slide removal and other heavy digging.

With every 304 attachment, big Koehring booster clutch cuts normal lever pull 50% . . . reduces operator fatigue, yet retains "feel" of load. Heat-compensator spring makes clutch tension changes automatically, maintains top operating efficiency at all times. Check 304 work capacity and all heavy-duty mechanical features in new 36-page catalog . . . write for your copy. Other Koehring sizes: 7¾ to 79½-ton lift capacities . . . ½ to 2½-yard dipper capacities. K272

KOEHRING HEAVY DUTY

KOEHRING

COMPANY, Milwaukee 16, Wis.

Subsidiaries: KWIK-MIX • PARSONS • [illegible]

HOW

Your railroad can cut costs with TOURNAPULLS

Sloping 4-to-1 bank, "D" dozes topsoil from hillside cut. Other jobs . . . *repairing washouts . . . stockpiling coal . . . clearing slides . . . plowing snow . . . clearing right-of-way.* Write for job-proved data on your type of work . . . or, see your LeTourneau Distributor.

Spreading ballast, "D" distributes even layers from 1" to 10" deep . . . can also pile entire load in one spot. Here, operator will later level ballast by lowering bulldozer blade to "float" on the rails and act as depth shoe. 8' 1" blade easily covers gauge of tracks.

Self-loading ballast, Tournapull gets about 4½ cu. yds. of 1½" rock per load. Power-proportioning differential, which applies 4 times the power to wheel on firmest footing, keeps "D" pulling through loose, soft, or slippery material . . . reduces downtime for weather.

Turning 90° in radius of 12' 9", "D" moves into position for spreading. Rig crosses tracks without blocking . . . does no damage to rails, switches, etc. Big 18.00 x 25 tires deflect load evenly over obstructions . . . do not chamfer ties, trip or damage block signals.

Loading from hopper, Tournapull's square top opening speeds handling. Wash water drains freely from bottom of scraper . . . eliminates hauling unnecessary weight. Rig also can be loaded by shovel or dragline . . . speeds both long and short haul operations.

Tournapull, Tournadozer—Trademark Reg. U. S. Pat. Off. DP-155-RR

Send now to: **R. G. LeTOURNEAU, INC., *Peoria, Illinois***

Name_____ Title_____

Company_____

☐ Please tell us more about 9-ton, 122 h.p. D Tournapull. ☐ Also send data on 19 m.p.h., 186 h.p. rubber-tired Tournadozer.

Cutting berm ditch along main-line right-of-way near Chillicothe, Illinois, D Tournapull self-loads root-laced clay . . . heaps up to 5 cu. yds. in less than a minute. With speeds to 28 m.p.h., the one "D" and its one operator completed this ditching job fast, and at a much lower cost than with former methods. "D" eliminated need for a work train and crew.

At approach of traffic "D" drives up on bank. As soon as the line is clear, rig will go back to work. No time is lost deadheading work trains to nearest siding . . . through-traffic is not delayed. Multi-disc 4-wheel air brakes hold rig safely on steep side slope.

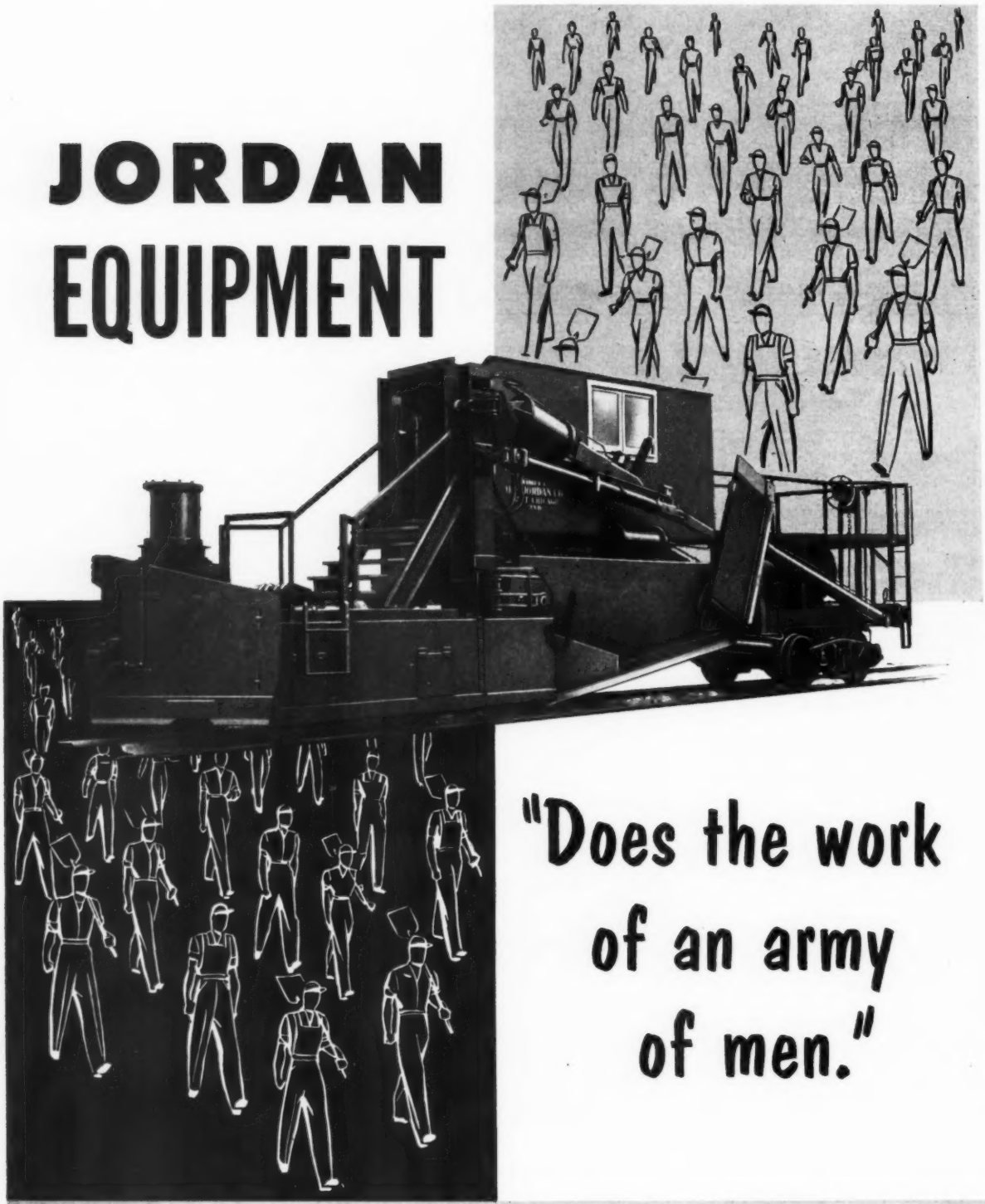
Self-powered moves at speeds to 28 m.p.h. save delays, get more work done. With big low-pressure rubber tires, Tournapull drives along right-of-way without damage to ties or tracks. Simplifies dispatching . . . saves time of loading and unloading . . . goes right to work.

At stockpile, "D" uses its bulldozer blade to side-cast screened rock to level a loading course. Electric-control blade gives fast, smooth dozing action. Rig has plenty of power (122 h.p.) and maneuverability (90° turns in 12′ 9″ radius) to speed dozing.

LETOURNEAU

LET R. G. LeTOURNEAU, INC., Peoria, Illinois

JORDAN EQUIPMENT



"Does the work of an army of men."

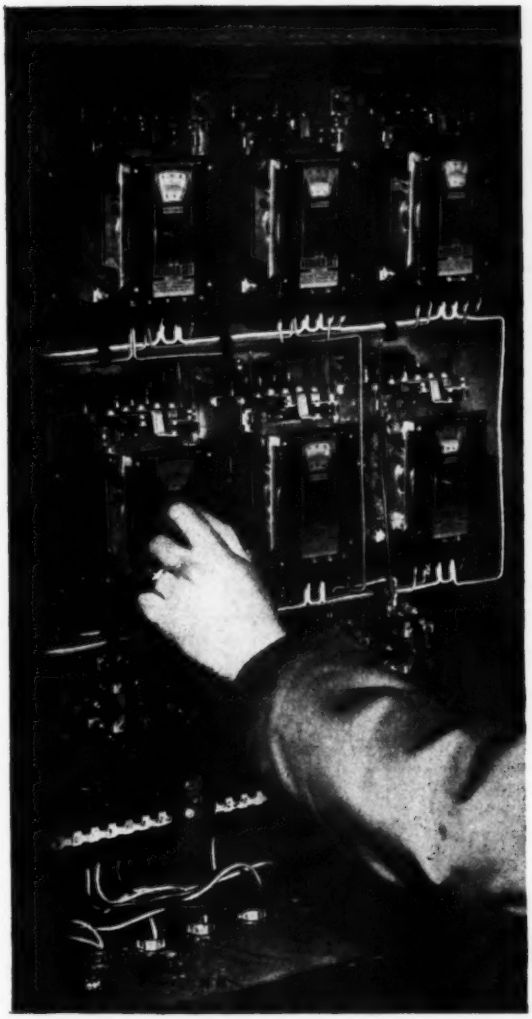
SPREADERS · DITCHERS · SNOWPLOWS

O. F. JORDAN COMPANY

WALTER J. RILEY, *Chairman of the Board*

EAST CHICAGO, INDIANA

TO GET LENGTHENED RAIL LIFE...



eliminate GUESSWORK IN END-HARDENING

Electrically controlled automatic equipment operating in protective atmospheres insures the finest end-hardened rails obtainable.

eliminate HAPHAZARD PATTERNS

Uniform hardness patterns are the result of positive control throughout the process. From a maximum hardness of from 331 to 401 BHN at the rail head, the transition is gradual to normal rail hardness. This creates a tough, impact-resisting end structure.

eliminate ONE FIELD OPERATION

Rails can be laid as received . . . eliminating equipment and personnel required for field end-hardening . . . speeding completion of track laying.

You are invited to visit our Pueblo Rail Mill to inspect CF&I modern rail end-hardening facilities.

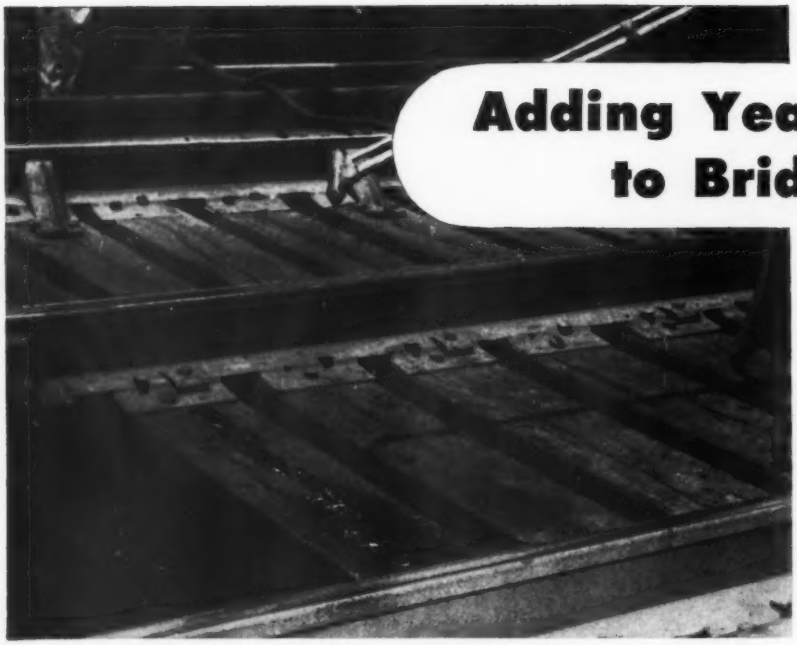
1068

RAILS AND ACCESSORIES

THE COLORADO FUEL AND IRON CORPORATION

DENVER, COLORADO

CFI



Adding Years of Service to Bridge Ties!

■ Unless retarded, splits and cracks in bridge ties get progressively worse. Hearts of ties are then exposed to decay. Ties fail and have to be replaced—a costly procedure as you well know.

Early in the service life of the tie, all openings should be filled in with Koppers Tie-Sealing Compound. This specially-processed coal-tar coating seals up splits, cracks and checks . . . retards their spread . . . protects ties against decay.

It is estimated that Koppers Tie-Sealing Compound will increase service life of ties by at least 5 years. It will pay you to use it on your railroad. Details and price information on request.

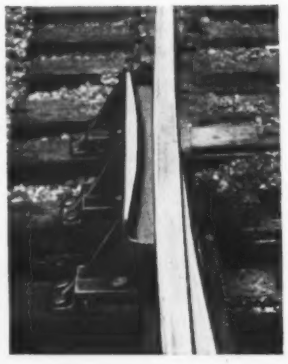
KOPPERS TIE-SEALING COMPOUND being applied by gun. This water-resistant coating protects bridge ties against premature failure caused by splitting, checking or cracking.

Use Koppers Tie-Sealing Compound on your railroad system. Details and price information on request.

KOPPERS COMPANY, INC., Tar Products Division, Pittsburgh 19, Pa.

KOPPERS

Q AND C SWITCH POINT GUARDS WILL ELIMINATE DERAILMENTS AT YOUR SWITCHES



Q and C Manganese Switch Point Guards will guard against wear on Switch Points from either facing point or trailing movements and will prevent derailments caused by sharp wheel flanges climbing on worn points.

Order now to save renewal of Switch Points and stock rails.

Other Q and C Products:

Derails, Guard Rail Clamps, One-piece Manganese Guard Rails, Step Joints, Wheel Stops, Gauge Rods, Car Replacers, Snow Flangers and Plows, Skid Shoes, Anti-Slip Rail Tongs, Flangeway Brackets, Electric Snow Melters, Gauging Tools, Foot and Heel Guards.

Serving Railroads Since 1886.

THE Q AND C CO.

90 West Street
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611 Olive Street
ST. LOUIS 1

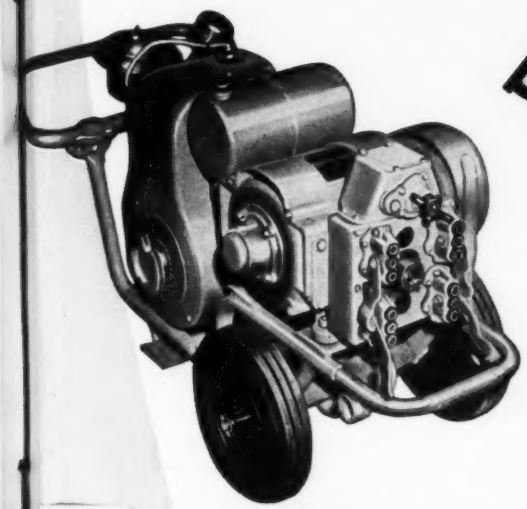
FINEST TRACK *at* LOWEST COST *in '5*

It's a SURE BET

IF YOUR BUDGET INCLUDES

JACKSON

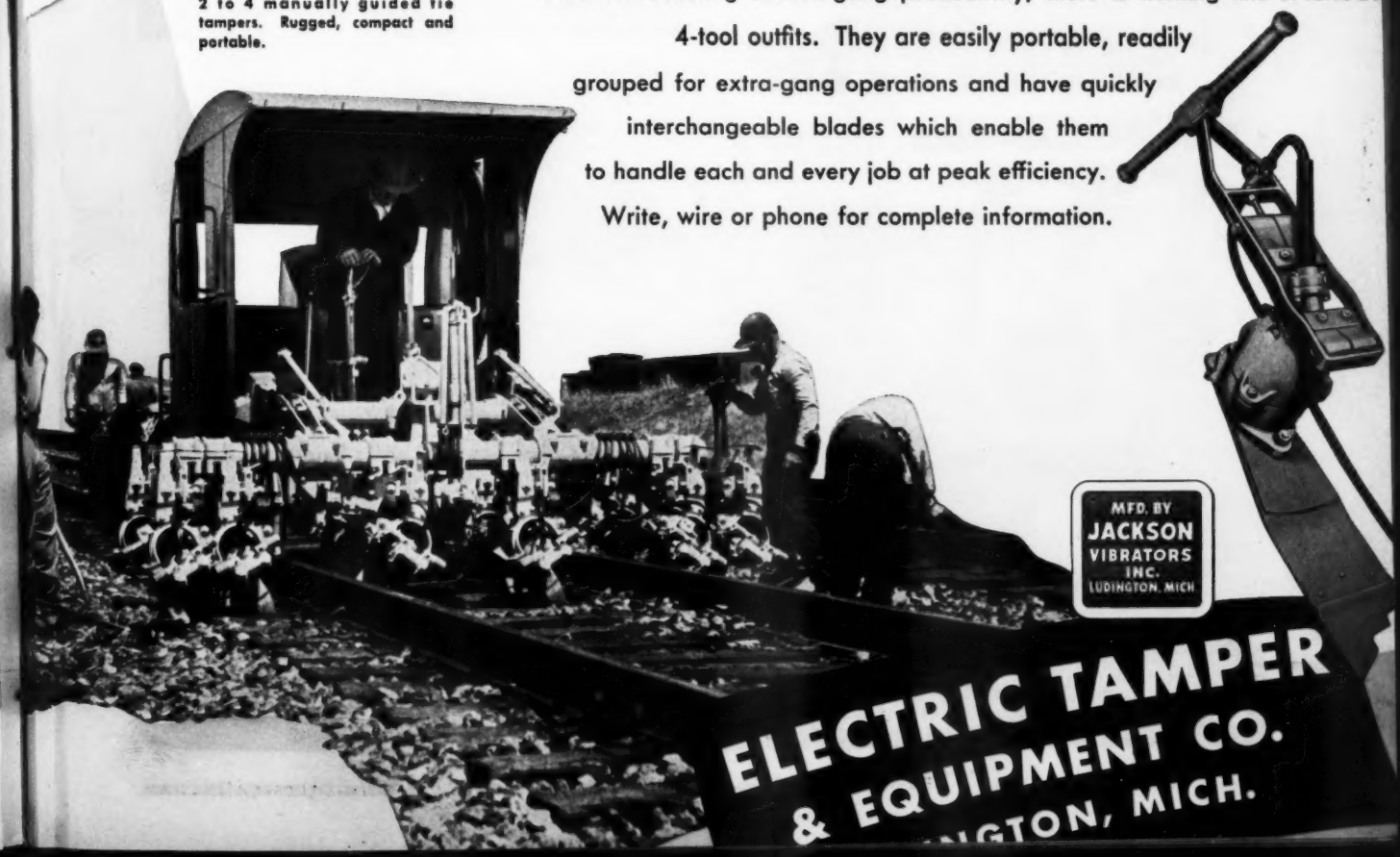
TAMPING EQUIPMENT



Model M-2 Power Plant serves 2 to 4 manually guided tie tampers. Rugged, compact and portable.

The experience of upwards of 60 leading roads and railroa contractors leaves no logical room for doubt—the JACKSON MULTIPLE unrivaled in ability to put up the finest track at the lowest cost—regardles of lift or type of ballast. Just as efficient in very low-lift surfacing operations this machine, in most instances, actually will save more than its cost in single season.

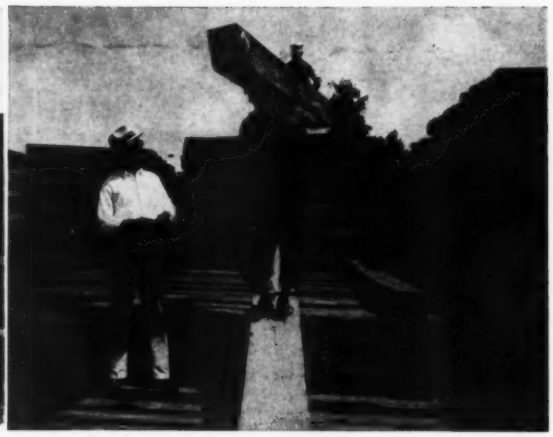
And for boosting section-gang productivity, there is nothing like JACKSON 4-tool outfits. They are easily portable, readily grouped for extra-gang operations and have quickly interchangeable blades which enable them to handle each and every job at peak efficiency. Write, wire or phone for complete information.



MFD. BY JACKSON VIBRATORS INC. LUDINGTON, MICH

ELECTRIC TAMPER & EQUIPMENT CO.
NGTON, MICH.

WHAT TIME DO YOU HAVE?



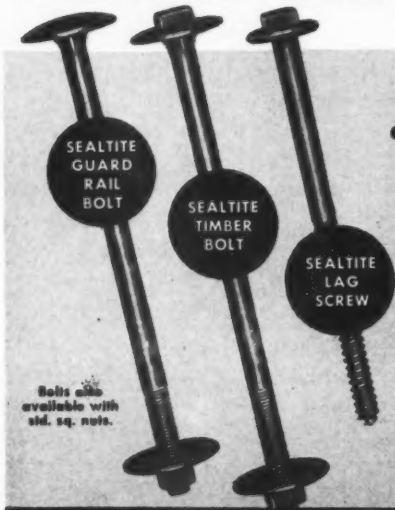
With a MACK GRAPPLE
(¼ cord size shown)
Time unloading gondola with crane operator and one helper, nine ties per load:
90 MINUTES

By HAND
Time unloading car with two men carrying ties from car to platform, one tie per man:
?

MACK Grapples are all welded steel construction, combining light weight with rugged strength. Made in seven standard sizes or built to customer's order. Any crane equipped to handle a clam shell bucket will handle a MACK Grapple. For full particulars, write to:

MACK WELDING COMPANY
9208 Grand Ave. Place — Duluth 8, Minnesota

Lewis
sealtite
railroad fasteners



Used by 85% of America's Class 1 Railroads

SPECIFY SEALED-TITE ZINC COATING
Sealtite products sealed in zinc give twice the wear and greater economy by cutting expensive replacements. For Double-Life and freedom from corrosion, specify Hot-Dip Galvanized . . . Sealed in Zinc!

See your Lewis representative, or contact factory for samples, prices and full details.

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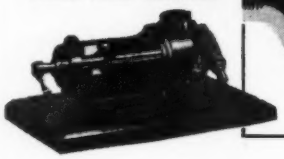
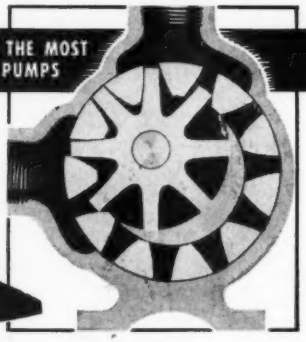
MINNEAPOLIS 14, MINNESOTA

LOOK FOR THIS STAMP OF U QUALITY

WHAT IT TAKES TO BUILD THE MOST COPIED OF ALL ROTARY PUMPS

EXPERIENCE and ENGINEERING SKILL of the VIKING PUMP COMPANY





Slide rule, graph and drawing paper are basic in developing rotary pump ideas.

The answer to Viking leadership, however, is beyond these basic materials.

Viking's store house of ideas holds thousands of feet of micro-filmed installation facts and drawings. Their use, plus continual experimenting and testing of new ideas produces results that make Viking the most copied of all rotary pumps.

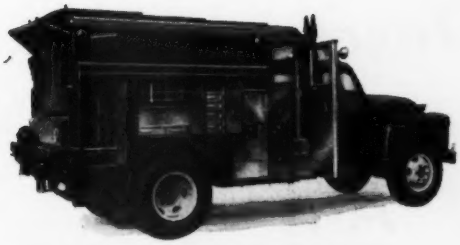
Send for descriptive folder 52SY today.

See Our Catalog in SWEET'S

Viking PUMP COMPANY
Cedar Falls, Iowa

HOLAN

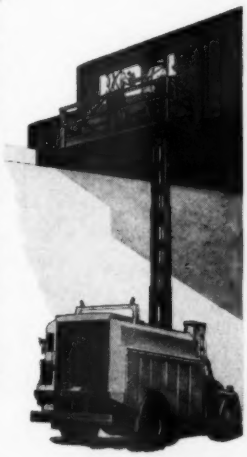
. . . Utility Bodies You Can't Afford to Overlook



MODEL CLC-138 RAILWAY CONSTRUCTION AND MAINTENANCE BODY has a built-in, four-man crew compartment. It is one of ten standard Holan body models. All models have double panel compartment doors and "feather action" pull type handles that are flush with the side of the body.

MODEL 1090 LR GENERAL SERVICE BODY
Nine standard models of Holan general service bodies offer a complete selection for any particular type of work. Holan body models are available with open top, low roof or high roof. They can be mounted on any chassis from ½-ton to 1½-ton.

MODEL 1209 CREW CARRIER BODY has six comfortable seats, all facing forward. Compartments on both sides of the body provide space for carrying extra tools and equipment. The body interior is heated by a heating unit carried in the forward right side compartment.



MODEL 1330R HYDRAULIC POWER
Holan hydraulic towers can be elevated to a height of 30 feet and lowered to approximately 10 feet, 3 inches. Operation is completely automatic. Large platforms give men a working area over 20 feet wide at any height. Low collapsed height allows clearance for bridges.

Holan utility bodies can reduce your construction, maintenance and servicing costs. This statement is verified by the increasing number of utility companies that will use no other make.

In recent years Holan engineers have introduced many advanced designs such as "curbside loading", new compartment arrangements, improved load distribution and "feather action" recessed handles. These and other exclusive Holan features have aided utility companies considerably in improving their construction and maintenance efficiency.

There's a way to find out yourself. Compare Holan bodies before you buy.

The dependable name in utility bodies

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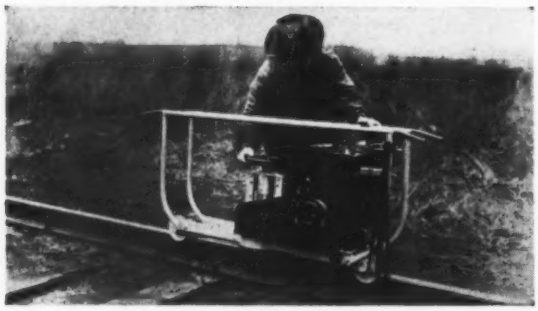
Increases
RAIL GRINDING ACCURACY



P-45 *PORTABLE RAIL SURFACE GRINDER*

This one-man cup wheel machine grinds welded rail ends and removes mill tolerance and scale before heat treating. With a high degree of accuracy at a minimum of operator's skill and effort . . . gives a smooth, highly polished surface. Portability and light weight make it ideal for heavy traffic lines.

Check these advantages!

- √ 3½ H.P. air-cooled gasoline engine.
- √ Adjustable V-Belt Drive acts as overload release, preventing damage to other moving parts.
- √ Cup Wheel is adjustable to compensate for wear.
- √ Ball bearings and wearing parts are protected against dust and dirt.
- √ Rollers on carriage guide are adjustable—assure proper cutting angle of grinding wheel.
- √ Length, 58 inches — Width, 14½ inches — Height, 25½ inches — weight, 225 lbs.

• *Write* for more information on the P-45 and other fast, easy-to-operate track equipment.

Railway Trackwork Co.

3207 KENSINGTON AVE., PHILADELPHIA 34, PA.

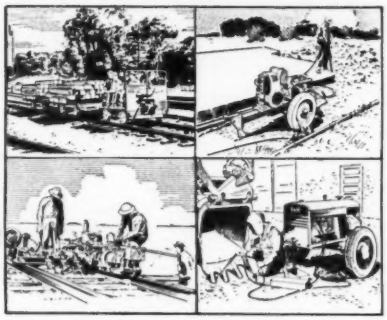
Rail Grinders—Switch Grinders—Cross Grinders—Surface Grinders—Rail Drills—Ballast Extruders—Bit Sharpeners—Tie Nippers—Grinding Wheels—Cut-Off Wheels

4282

Wherever Engine POWER is Needed . . .

WISCONSIN *Air-Cooled* ENGINES

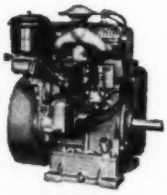
Fit the Job and the Machine •



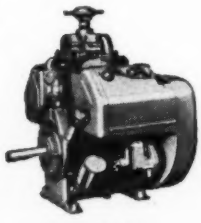
Wherever and *whenever* Wisconsin Heavy-Duty Air-Cooled Engines work . . . on and off the right-of-ways, winter and summer . . . you'll find that Wisconsin Engines measure up. A wide range of 4-cycle single-cylinder, 2-cylinder and V-type 4-cylinder models, 3 to 30 hp., fit many railway maintenance units without wasted power and with maximum service benefits. Heavy-duty construction, combined with extremely compact design and light weight are added advantages — and dependable AIR-COOLING permits trouble-free service under all climatic conditions.

Specify Wisconsin Heavy-Duty Air-Cooled Engines for the utmost in power satisfaction. Write for descriptive data covering all 4-cycle, single-cylinder, 2-cylinder and V-type 4-cylinder models, 3 to 30 hp.

Single cyl.
3 to 9 H.P.



2-cylinder
7 to 13 H.P.



V-type 4-cyl.
15 to 30 H.P.

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46 WISCONSIN

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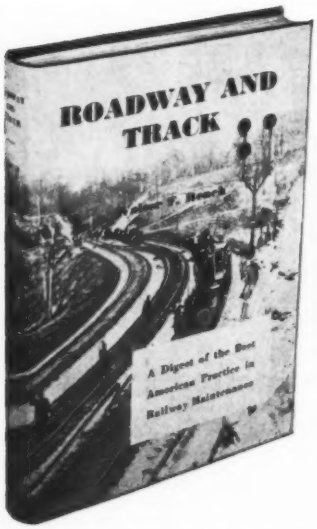

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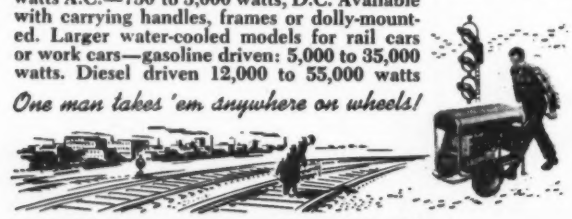

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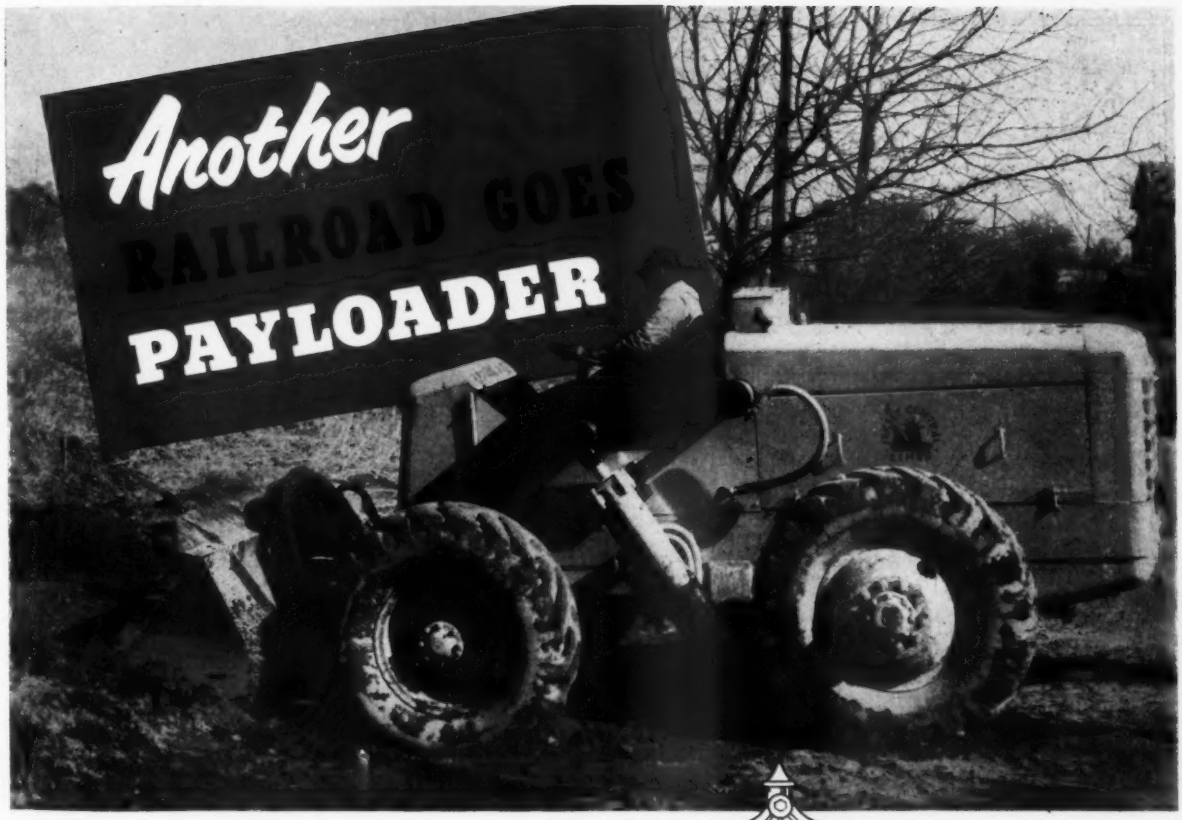
(My commission expires February 3, 1953.)



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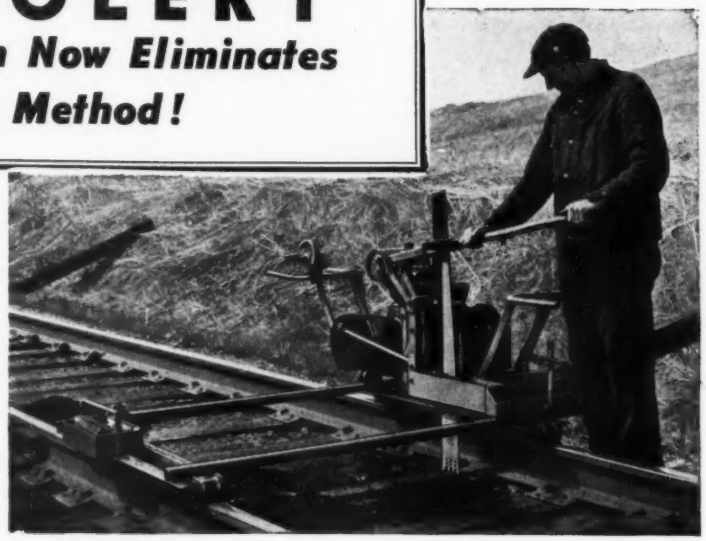

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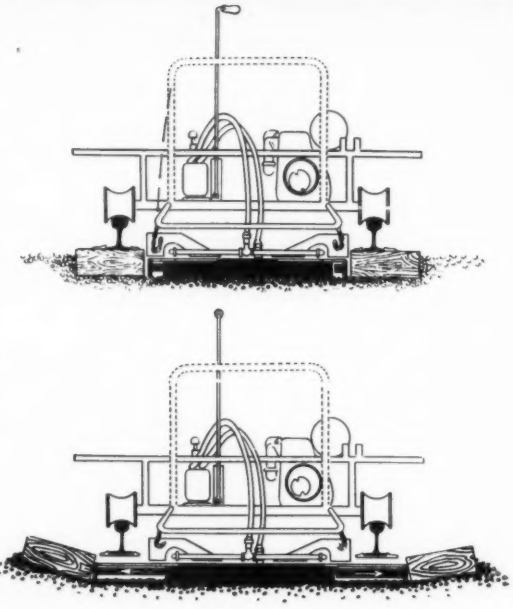

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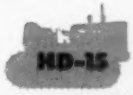

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Railway Engineering and Maintenance

SIMMONS-BOARDMAN PUBLISHING CORPORATION
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Subject: Magazine or Textbook?

November 1, 1952

Dear Readers:

A problem that is always before an editorial staff is to determine what constitutes a story and what doesn't. Among the editors of Maintenance this question comes up nearly every day, sometimes several times a day. You might think that after a few years of this the decisions would come easy. Sometimes they do, but more often than otherwise there is an element of doubt that must be cleared up before a decision can be made.

When considering whether a particular development or subject should be "covered" in our pages our principal criterion is whether it is something that at least a fair proportion of our readers will find of interest and value. Where some entirely new practice or machine is under consideration the question is easy to answer, for we know that you are always interested in such developments. But suppose our attention has been called to an operation on a particular railroad, say a rail-laying gang, which at first was understood to be unusual in one or more respects but which, on closer investigation, is found to be merely just another example of modern practice? If our interest in the development as a subject for a story shows signs of cooling, someone on the staff is certain to come up with this question: "What about the younger readers who may not have been on the job long enough to know how a modern rail-laying gang is equipped and organized? Don't we owe them an obligation to publish such information even though it may be commonplace to our older readers?"

After that the discussion can easily degenerate into an interminable argument, for the questions raised are not easily answered. On the one hand it can be held that this magazine is not a textbook but is essentially a periodical for reporting current developments. At the same time the point can be made that even our older readers need to be reminded at least occasionally of the fundamentals of good practice even though these may have remained unchanged for many years. In our thinking the first point of view carries the greater weight, yet we cannot deny the validity of the second. So what we try to do, while endeavoring to make the magazine essentially a news periodical, is to work in a little of the "textbook" material from time to time. Parts of the article in this issue by Malcolm Condon on yard maintenance fall into this category.

By and large, however, we try to emphasize the new or unusual, whether it is a machine or practice or merely a different way of looking at the age-old problem of safety (see the article by Charles Weiss in this issue). If a railroad introduces a new wrinkle in laying rail, or surfacing track, or in doing some other kind of work, our policy generally is to confine the story insofar as possible to the new development instead of describing the entire operation from "soup to nuts". We feel that, by this policy, we not only conserve your time, but more space is made available for bringing to you information we feel is of the greatest value in helping to solve current problems.

Yours sincerely,

Merwin H. Dick

Editor

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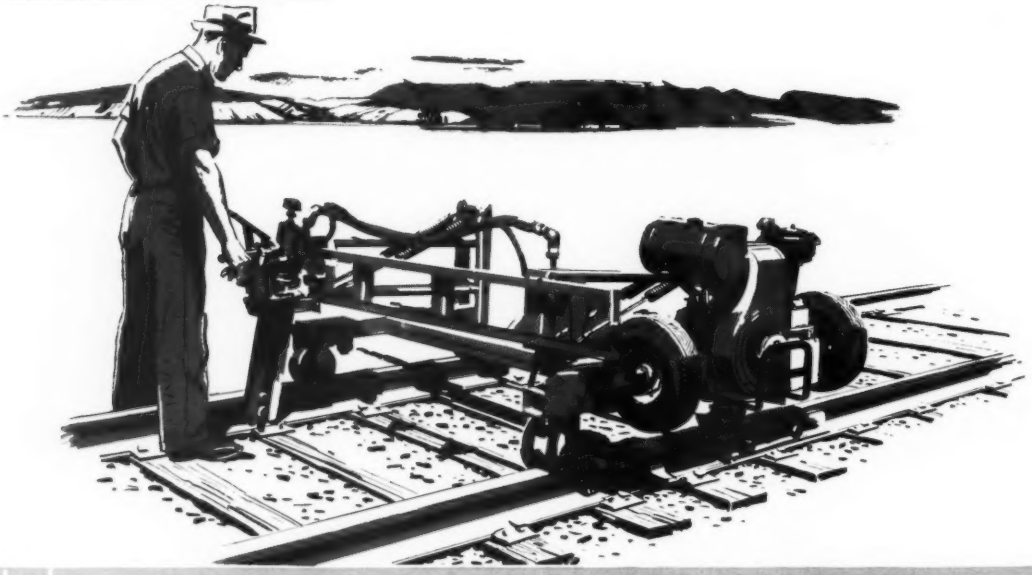

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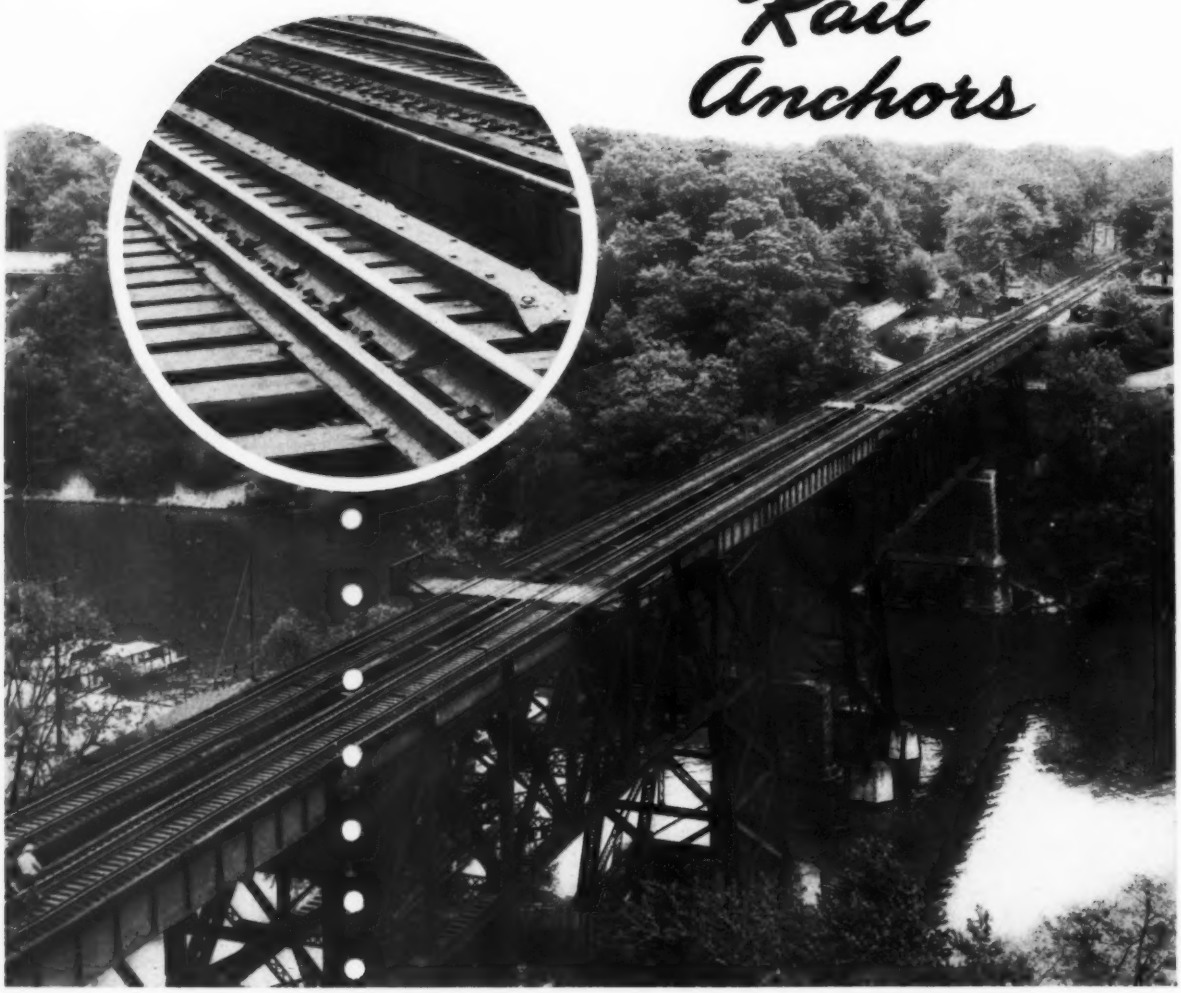

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Diesel Power—

What Effect on the Track?

Life has never been quite the same for the railway maintenance officer since the diesel locomotive entered the picture in an important way. Among other things he has had to consider what effect the replacement of steam with diesel power might have on his thinking relative to the most economical weight of rail to be used under a given set of conditions. Some interesting comments on this phase of the subject will be found in the What's the Answer department of this issue.

More light is thrown on the subject by a recent experience of the Missouri-Kansas-Texas, as related by K. H. Hanger, chief engineer, in an article published in a recent issue of the *Railway Age*. This is no mere theoretical discussion of the economics involved; it is an account of how the Katy approached the problem of deciding whether diesel locomotives could be operated with safety over a line on which much of the rail was not only very light but also very old. Located in western Oklahoma the line involved, known as the Northwestern division, is slightly over 300 miles in length. It is laid largely with 60 and 65-lb. rail all of which is at least 40 years old. Only 37 miles of the line are ballasted and, although treated ties are used, only about 50 per cent of them have tie plates.

Until February 1951, Mogul-type steam locomotives, with a tractive effort of 31,750 lb. and weighing a total of 330,400 lb., were used in freight service on this division. These locomotives had a weight on each driving axle of 49,000 lb. Because of the substantial economies which were being realized through the use of diesel locomotives on other parts of the system, the Katy gave serious consideration early in 1951 to the feasibility of operating them over the Northwestern division in place of the steam power. The matter of axle loads was given careful consideration and after much deliberation a loading of 52,000 lb. per axle was arbitrarily established.

For various reasons, however, the railroad desired to put into service on this line the Electro-Motive 1500-hp. GP-7 locomotive which weighs 240,000 lb. and has an axle load of 60,000 lb. As explained by Mr. Hanger the Katy was thus face to face with the question whether a locomotive having this axle loading could operate over such light rail without becoming derailed, or fracturing, spreading or turning over the rail. There was only one way to get the answer and that was through actual experience. Accordingly, on February 21, 1951, a GP-7 road-switcher locomotive was operated over the line under a speed restriction, hauling a local freight. Since the locomotive rode well, with no tendency to nose or sway, on the first leg of the trip, the speed was stepped up on the return leg, with similar results.

Immediately after the test run diesel locomotives were placed in regular service on the Northwestern division at the same maximum permissible speed as prevailed for steam locomotives. Mr. Hanger states that no difficulties whatever have been encountered with the track structure and that it is planned to continue the use of diesel locomotives on this territory.

The implications of this experience, and others like it, go far beyond the immediate problem. The deeper lesson is that many of the prevailing ideas regarding the effect of locomotives on track, which have been gained through experience with steam power, must be discarded or revised in major respects when diesels enter the picture.

SNOW MELTING—

Can Radiant Heating Be Used by Railroads?

WHEN a railroad man notes the many applications of the radiant-heating technique to the melting of snow on industrial outdoor ramps, truck-loading areas, store sidewalks and driveways, and even highway underpasses, he may well wonder why this technique cannot be applied to station platforms and team driveways of railways. Upon investigation he learns that the initial cost of a radiant-heating system runs into a considerable sum of money, and he is immediately discouraged from exploring the idea to a conclusion.

It is true that the installation cost of such a system may cause some hesitation, but there are instances where this cost can be justified. Many railroads are modernizing stations at the more important points and, in almost all such instances in the northern section of the country, part of the work of bringing these stations up to present-day requirements is the provision of modern heating plants. To increase the B.t.u. output of a new plant sufficiently for heating the circulatory water needed for a radiant-heating system would add relatively little to the cost of the plant. At points where steam is available from a terminal central plant, the return steam or condensate can be utilized to heat the circulatory water at low cost.

Also part of the work of modernizing passenger stations is the replacement of platforms made of screenings, chats, wood and brick with concrete or asphaltic concrete types because of the lower maintenance required for the latter. These materials are quite satisfactory for transmitting the heat needed by a radiant-heating system, and the six-inch slab thickness required for the proper embedment of the heating coils is the same as generally used for all well-designed concrete platforms.

Safety probably is the greatest advantage of a radiant-heated station platform and is the hardest to measure in dollars and cents. However, the I.C.C. accident statistics reveal that a large number of accidents occur while passengers are getting on and off trains, resulting in substantial settlement claims, and it is certain that some of these are due to snow and ice conditions. One bad accident could well cost more than the installation of a radiant-heating system which could easily eliminate such hazards and prevent accidents from occuring.

In addition to the high-installation cost that has been advanced against the use of radiant heating for use in melting snow has been the arguments that the sectionmen will clean the platforms anyway and that a bulldozer or some other piece of equipment can be used to clean driveways. While this is no doubt true, the first requirement of sectionmen is that of keeping the tracks operable, and it is well known that during bad storms there often are not enough men available for this work. A serious accident could well happen before the station platform can be cleared.

While there is no intention here to recommend the use of radiant heating over all other forms of snow melting or disposal, there is little question that there is a place for radiant heating at special locations and under certain conditions. This is especially true in view of the claim that operating costs of a radiant-heating system during a heavy snow storm are only about six cents a thousand square feet.

TRACKMEN—

How Should They Be Identified?

SPEAKING from the floor at the last Roadmasters' convention, a member asked, "Does anyone here have a badge or other means of identification for the use of his track forces?" Not only were all the formal replies given in the negative, but much of the informal conversation that immediately ensued buzzed with a counter query, "Why identify them?"

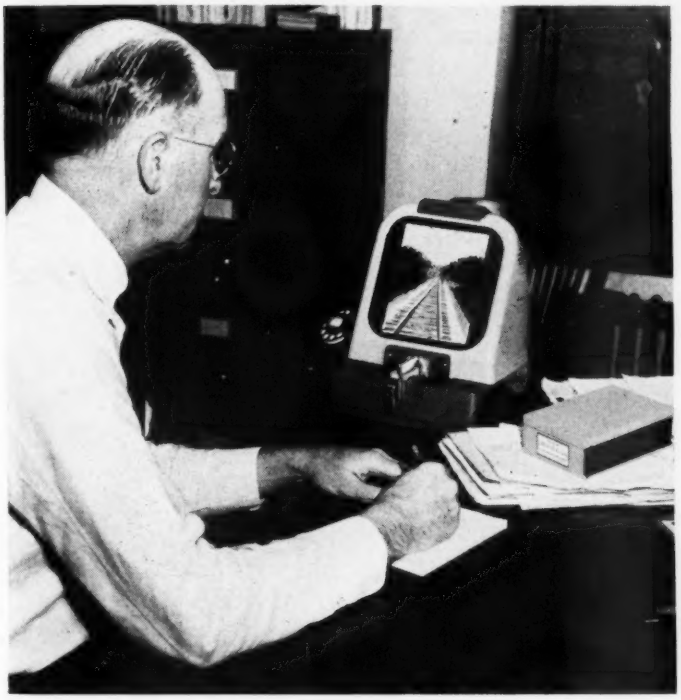
Sensing that undertone, the original speaker told why he had asked the question. He said that an unusual situation had occurred on his railroad which indicated that some means of identifying trackmen might be desirable.

This situation concerned a tractor and trailer or some other piece of equipment which crossed his railroad at a farm crossing. While crossing the tracks, a dragging part of the equipment caught on the rail, allowing the equipment to pull the track quite badly out of line. The operator of the equipment, seeking to avert a serious accident, ran down the track and flagged an approaching train. After looking over the track, everyone concerned decided that the train could proceed with safety at slow speed. The train pulled over the spot that was kinked and rolled on. The equipment operator, who had failed to identify himself in the excitement as an outside party, also went on his way, probably feeling satisfied that he, by calling attention to the condition of the track, had averted a serious accident.

Subsequently, an accident or near accident occurred when a train passed over the "unsafe" track at normal speed. Investigation showed that the crew of the flagged train had reported the incident but, believing the man who flagged the train was a trackman, had indicated that the track was being repaired. Thus, because of a mistaken identity, perhaps aggravated by the poor judgment of several employees involved, no slow order was issued, the track-maintenance authorities were not notified, and an accident occurred.

This story stopped the tittering among the assembled roadmasters and left them with something to think about. Whether it proved to them that a means of identifying trackmen is desirable or not is problematical. But they undoubtedly returned to their own railroads with a determination to take "steps" to prevent such an occurrence from getting "too close to home." Whether those "steps" take the form of identification emblems or some other remedial measures, the results will be worth the telling of the story that prompted them.

BELOW—Color photographs of weed-control tests enable C. J. Code, engineer of tests, M/W, to make practically direct comparisons of before-and-after weed growth conditions. RIGHT—J. E. South, engineer of bridges and buildings of the Eastern region, examines a color slide taken from his file of bridge installations with the aid of his desk viewer



Pennsylvania Finds

Practical Uses for Color Photography

File of color transparencies of bridges on the Eastern region, kept in the office of the engineer of bridges and buildings, has many uses. Also, the engineer of tests, M/W, uses color slides in evaluating the results of tests of weed-control chemicals and of bridge paints.

• An increasingly common practice among railroad engineering and maintenance officers is to keep files or albums of photographs of facilities or current projects, both as a matter of interest and also to provide a visual record for future reference. The practice is almost universal to maintain the photographic records in the form of black and white prints. On at least one railroad—the Pennsylvania—it has been found that photography becomes a more effective working tool when the pictures are in the form of color transparencies, and as a consequence regular use is being made of such transparencies in the offices of at least two engineering department heads on the Pennsylvania.

These officers started the use of color photography independently of each other, and for somewhat different purposes. They are J. E. South, engineer of bridges and buildings of the Eastern region, and C. J. Code, engineer of tests, M/W, both of whom have headquarters at Philadelphia. After several years experience with the making and use of color transparencies both Mr. South and Mr. Code are convinced that they afford a much more practical and effective tool for their respective purposes than black and white prints.

For a number of years the office of engineer of bridges and buildings of the Eastern region had been making use of black and white photographs of the bridges of that region. Several years ago it occurred to Mr. South that the use of color transparencies for this purpose would have a number of important advantages. For one thing the contrasting colors in a transparency bring out details that otherwise would not be apparent. For instance, the color sometimes affords the only contrast between members that may be in the same plane. He also reasoned that the 2-in. by

2-in. cardboard frames in which the color transparencies are mounted would lend themselves to more systematic filing in a compact space than would be possible with photographic prints.

Has About 2,000 Slides

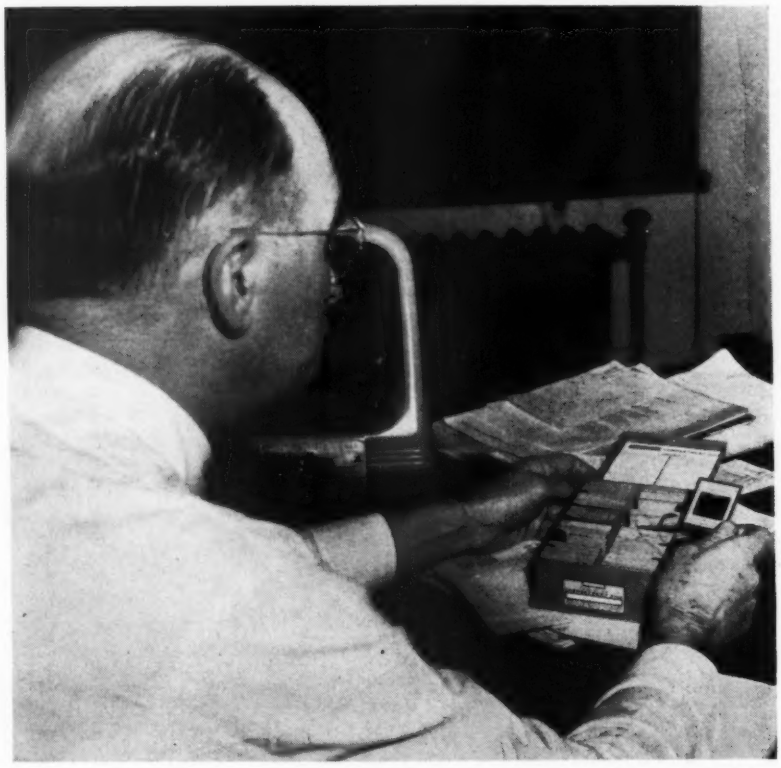
Mr. South started building up a file of color transparencies in November. 1949 and since then approximately 2,000 have been taken and filed in his office. In this work he is assisted by A. H. Hillman, assistant engineer of bridges. Both have their own 35-mm. cameras and both use exposure meters. Both a hand-held viewer and a desk viewer are used in the office to examine the slides.

The objective is to compile and maintain a photographic record of all the bridges on the region. The photographs are normally taken during the annual bridge inspection, although both Mr. South and Mr. Hillman generally take their cameras with them whenever they go out on the road. The objective, when photographing a particular structure, is first to obtain an overall view, after which one or more pictures may be taken to show unusual conditions or particular features. Before starting on a trip a check of the file is made to see if photographs are already available of the bridges that are to be visited. If they are, further photographs are not taken unless work is planned that may indicate the need for photographs to show particular conditions.

The transparencies are filed in a cabinet containing drawers designed especially to accommodate them. To permit the transparencies to be quickly identified each of them is lettered with information showing the bridge number, the division or branch, and the date the picture was taken. The same file also contains color transparencies of other structures, such as stations and shelters. Such structures are photographed as occasion permits, but no systematic attempt is made to obtain a complete photographic record of them.

How They Are Used

Many uses are found for the photographic record of bridges. The photographs are particularly helpful when plans are being made for renewing specific structures or for making alterations or repairs to existing bridges. In the case of older bridges the available plans may be meager or inadequate as to the information shown. In such cases the photographs help to ascertain the true condition. Also, the photographs may show situations or conditions that are not revealed by the plans. It frequently happens that the availability of pictures of a particular bridge in the office will preclude the need for a field trip.



THE COLOR SLIDES taken by Mr. Code are stored in a compartment file in which the drawers each have a capacity of approximately 240 mounted color transparencies

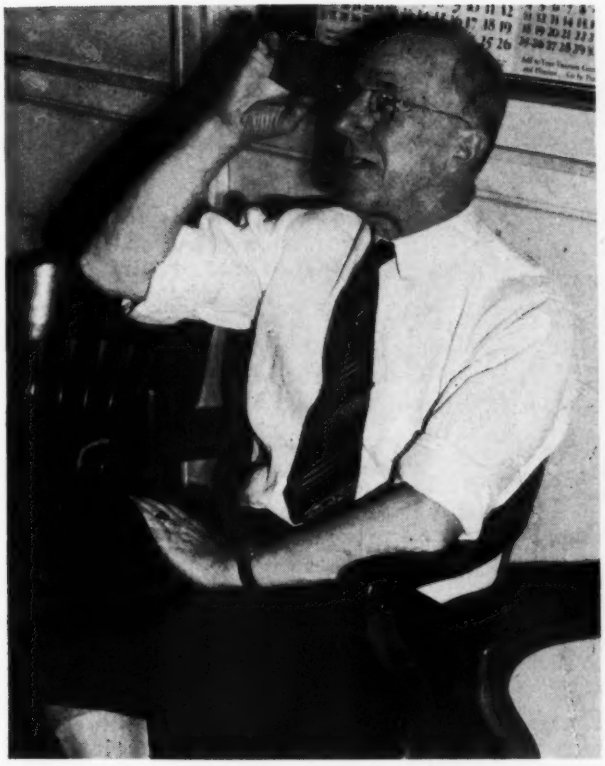
The uses that are made of the photographic file can best be shown by a number of examples. In one case, involving a bridge with a movable span, the masonry piers at the ends of the drawspan were surmounted by steel bents for carrying the head logs on which the miter rails were supported. These bents were in need of repair. Photographs were taken which were used to good advantage in planning the repairs and in making the necessary details drawings. Incidentally, in such instances, if one or two of the dimensions are known, it is possible to approximate other dimensions by scaling on the transparencies.

Another example involved a bridge in the vicinity of which there were a number of old unused masonry piers. A question arose in the office as to whether the old piers were in the water or on shore. Reference to the picture file quickly clared up this question.

Again, a question arose in the office as to the clearance under a bridge carrying the railroad's tracks across a street. The photograph of the structure showed that the clearance was clearly lettered on the web plates of the girders.

Use by M of W Test Organization

Mr. Code has found color photography to be particularly helpful in connection with tests made to determine the effectiveness of weed-control chemicals. His experience has been that, in evaluating the results of such tests, it is extremely difficult to reach a dependable conclusion merely on the basis of visual inspections made on the ground. For instance, if two or more chemicals are being tested, it is necessary, in order to evaluate the results properly, to have clearly in mind not only the conditions that prevailed at each of the locations before the applications, but also to be able to make a direct comparison of the different locations when the final inspections are made. The accuracy of such comparisons, made from memory or from written notes, leaves some-



A HAND-HELD slide viewer is also kept in Mr. South's office. A. H. Hillman, assistant engineer of bridges, uses it here

2,000 COLOR SLIDES are in these two cabinets in Mr. South's office. Plenty of space is available for additional slides

thing to be desired to say the least.

A similar problem is encountered when evaluating the results of tests of different paints. For about 10 years the Pennsylvania has had under observation a test installation of black bridge paints on its Declair bridge, which carriers its main line to Atlantic City across the Delaware river. As with weed-control chemicals the problem, in evaluating the results, is to make comparisons of conditions at different locations.

Photography being one of Mr. Code's hobbies, he has long recognized the value of photographs in illustrating reports and in helping him to appraise the results of tests. Attempts to apply black and white photography to the study of weed control gave unsatisfactory results. For this purpose it was necessary to obtain specific contrasts, and experiments to this end were conducted with different types of filters and films, but the results were far from satisfactory.

Color Prints Not Satisfactory

He then began to consider the possibilities of color photography. Experiments were conducted with various color processes. The first experiments were with color prints made from color negatives, but it was found that the reproduction of color contrasts by this method was disappointing. Color transparencies, on the other hand, were found to afford an effective and reliable process for reproducing colors, and as a consequence these have been used exclusively in connection with weed control tests, for about two years. The application to paint tests was a natural development subsequent to the use on weed control.

In taking color pictures, Mr. Code uses a 35-mm. camera of the folding pocket type, with an f3.5 lens. If at all possible all his pictures are taken in bright sunlight. The color slides, as mounted in cardboard frames, are kept in his office in a compartment file in which each box or drawer has a capacity for 240 slides. When examining the slides he uses a desk-type illuminating viewer.

Color Slides Show True Conditions

With the aid of the color transparencies, and while sitting at his desk, Mr. Code can make practically direct comparisons of the nature and condition of the vegetation at a particular location before and after the application of weed-control chemicals. Also it is possible for him, in a matter of a few seconds, to make a direct visual comparison of the actual conditions at different locations that may be miles apart. The same advantages apply when evaluating the performance of different bridge paints. In the future it is planned to use the color transparencies for making records of paint failures in cases where the paint was applied as a routine matter.

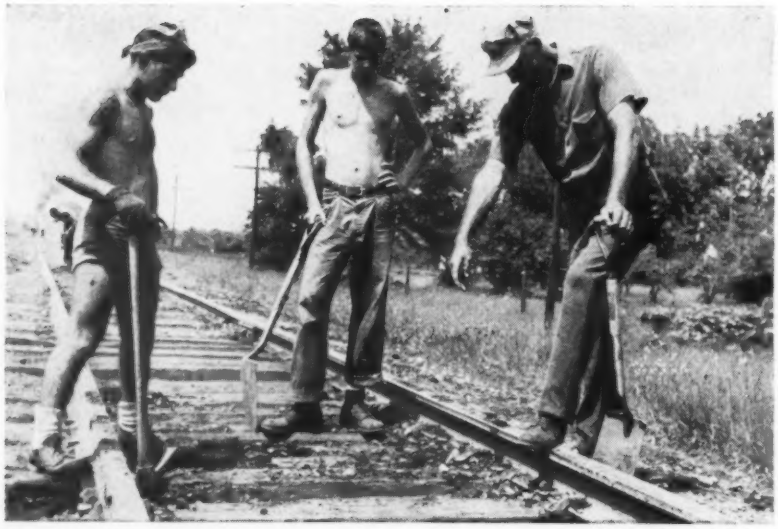
Generally speaking, the results of tests made with the aid of color transparencies are incorporated in written reports prepared by Mr. Code. On occasion, however, if it is desired to include in the report the means by which those reading it can draw conclusions of their own, color prints are subsequently made and incorporated in the written report.

The use of color photography as a workaday tool on the Pennsylvania is considered definitely to have progressed beyond the experimental stage. Furthermore, it is not considered unlikely that additional practical uses for the color photography process will be found as time goes by.

Don't be Lulled

Common

By Charles Weiss
Assistant Engineer
Pennsylvania
Chicago



INEXPERIENCE, contrary to popular belief, does not cause accidents—however . . .

EXPERIENCE, as in the more skilled trades, often breeds neglect of safety rules

HAZARDS, such as those prevailing in emergencies, make workers more cautious

• Why have erroneous ideas about safety become prevalent? Why are such ideas wrong? Let's take a closer look at three of these fallacies and see how they "got that way."

The oft-repeated statement that *most injuries occur to new or inexperienced men* carries the force of logic, but is not in accord with the findings of many safety records. In fact the opposite is quite often true. There are a number of reasons for this. In the first place, new men are usually given special instruction in safety. Foremen and others observe them carefully and correct any unsafe practices they may follow. The men themselves are generally receptive to such treatment. Being new they willingly enter into the spirit of the occasion. They may also cooperate in order to make a good impression. In some cases there is an added attraction of novelty. Thus a new man, receiving most of the foreman's attention and instruction, and having more than the average amount of enthusiasm on the subject of safety, is not likely to be the victim of an avoidable injury. He is indeed very well safeguarded.

Hazards Face Older Employees

On the opposite side of the ledger we may consider the experienced man with longer service. If the new man does receive the bulk of training and instruction, it must be at the expense of the older man. In some cases this older man may have so much service that it extends back prior to the time when safety was considered as important as at present. In other words, he may never have had such a good start in safety as the new man is now being given. An older man may become overconfident and even callous. He may want to do things his own way and, because of his experience, his foreman may be reluctant to correct him. As he has gotten older, his senses have be-

to Sleep by
Safety Fallacies

Track maintenance forces have three general misbeliefs concerning safety. Seemingly, they have come to believe that most personal injuries occur . . .

- **To new or inexperienced men**
- **Among the more unskilled grades**
- **Where conditions are hazardous**

come dulled and his reflexes slower. With new developments constantly taking place he may also have become like the old dog who learns new tricks with difficulty. It may therefore be concluded that while the new man has been surrounded with proper safeguards the older man has had his removed. The older employee thus becomes a potential subject for a common occupational accident.

All foremen and other supervisory employees should realize that there can be no relaxation in safety instruction and observation either in the case of new men or older men. Safety must be a continuous process.

The seemingly common belief that *most injuries occur among the more unskilled grades* is apparently logical, but it, too, is contradicted by the facts. It is reasonable to expect that a man whose duties require more physical effort and less mental effort than those of a skilled mechanic is more likely to get hurt than the latter. A higher graded man, such as a carpenter, develops dexterity and manual skill. Since the performance of his duties calls for more thinking, he has less need for brawn than brain. It is of course true that the higher graded mechanic has certain occupational hazards that do not confront the so-called unskilled laborer. On the other hand the higher trained man should have a better understanding of safety and be expected to practice it more wholeheartedly. To some extent he is required to instruct others in safety, especially if he has a helper. To become skilled he had to have experience, but as we have previously observed this is often of doubtful benefit in accident prevention.

As sound as this accepted reasoning may be, we find that all too often there is an exceedingly high proportion of personal injuries among the higher crafts as compared with workers among the lower and more unskilled grades. An analysis of actual cases offers the best explanation for this contradictory situation. It should first of all be stated that there is not, or at least should not be, such a person as an unskilled man in modern maintenance. The lowest operations require skill to perform them efficiently.

Why Mechanics Get Hurt

The principal reason why too many mechanics get hurt is very similar to the conclusion reached in the first part of this discussion. Members of this group receive a minimum of safety observation and instruction. They are on their own and no one bothers much with the details of their work. Their work is specialized and is less understood by others who might be in a position to check on their performance. In many cases these men work more by themselves than in groups and hence do not get as much benefit from warnings given by fellow employees. Finally, as has been pointed out before, being experienced and skilled men, they are often "set" in their ways and skeptical of any instruction. They may agree that safety is a wonderful thing for the man who needs it, namely the common laborer.

The solution is the tried-and-true one of greater safety activity on the part of the men who supervise these employees. This group of men must be imbued with the knowledge that skill and intelligence cannot be substituted for the actual, constant practice of the basic principles of safety.

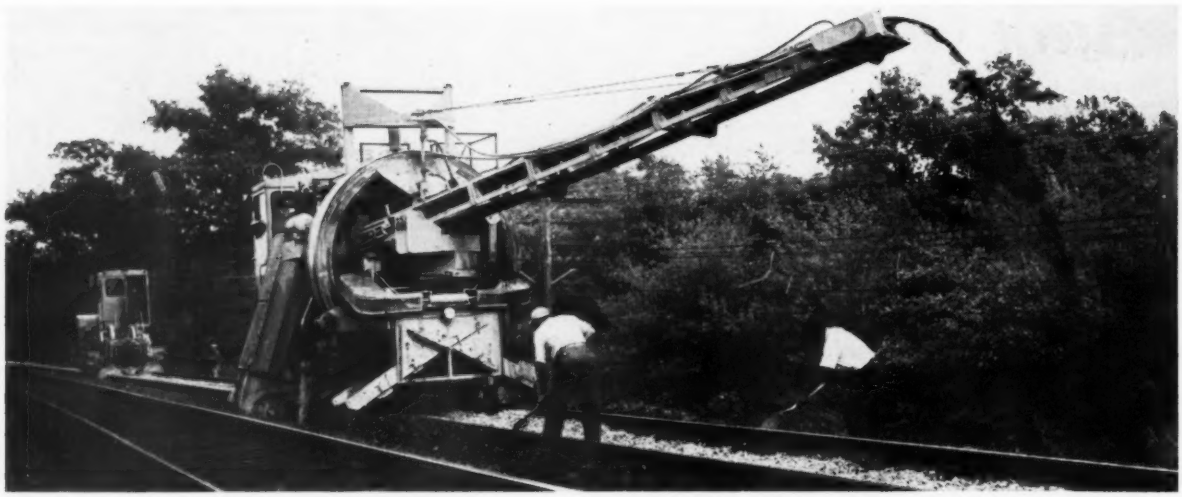
One might rationally expect that *most injuries occur where conditions are hazardous,* because, other things being equal, the likelihood of accident or injury should normally be proportional to the condition of hazard involved. Actually, fewer accidents occur where conditions are dangerous than where they are not. It is well known that very few accidents occur at certain grade crossings where the conditions are worse than at locations where the view and other characteristics are excellent. This is due to the fact that when conditions are bad people are usually cautious, but when the conditions are good they become careless. Thus statistics often show a bad accident record at a crossing where it seems hard to realize how an accident could occur, and a good record at a crossing where one would expect many accidents.

The same reasons underlie the prevalence of other accidents and injuries. Under the stress of emergency work, as at wrecks, washouts and in storms, avoidable accidents do not occur often. The same is true of heavy operations such as rail laying and comparable maintenance jobs. Nor do many injuries occur due to unfavorable weather, poor visibility or slippery and wet conditions. When such conditions prevail men are naturally cautious. Many times more injuries result when working conditions are normal and there is no undue stress.

Instinct Plays a Part

When the presence of danger is obvious, there is evidently enough instinctive caution and probably fear to make the average human being careful. This animal-like instinct does not, however, seem to function under ordinary conditions. The human quality of common sense also seems to be largely submerged at such times. In their stead a tremendous, more dangerous hazard is introduced which accounts for the prevalence of accidents under simple, normal circumstances. That hazard is the failure to think.

The simple truth is that experience, knowledge and intelligence do not guarantee immunity from personal injury. No condition is inherently safe. The threat of bodily harm is present everywhere and at all times. It lurks in the most peaceful and unsuspecting places. A combination of these factors adds up to a serious situation for which, fortunately, there is indeed a positive remedy. That antidote is to practice safety ceaselessly and unswervingly everywhere at all times.

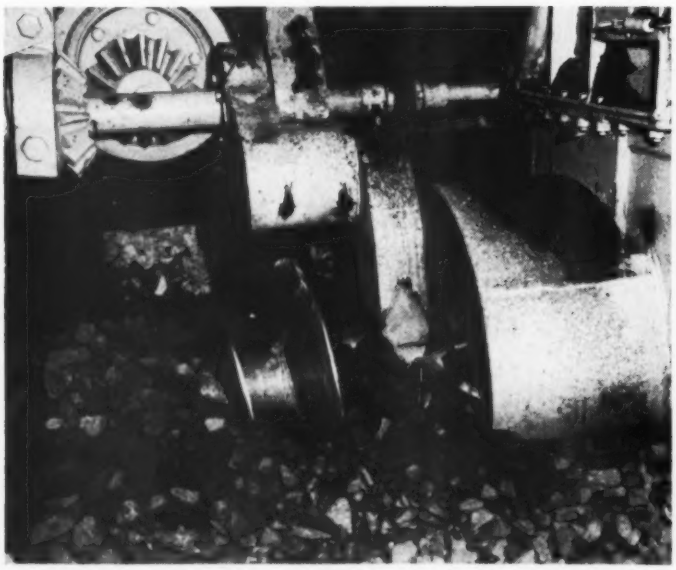


Dirt removed from the ballast is carried by the conveyor and wasted over the adjacent bank. The conveyor can swing in a 140-degree arc to waste dirt over the bank, over the second track to the opposite shoulder, or into a car behind the cleaner

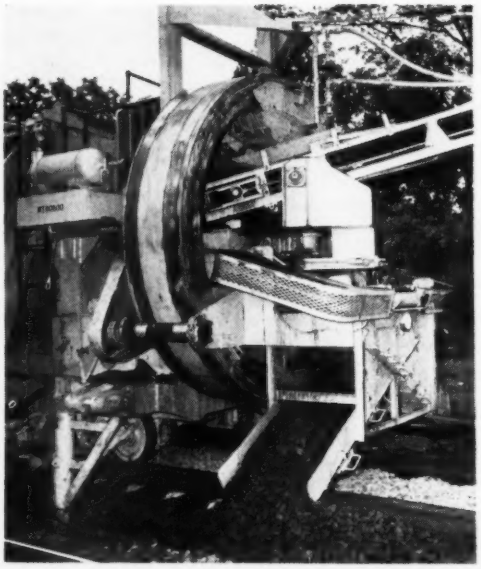
Since both units are self-propelled, either may furnish the motive power to transport the combination. Running speeds up to 25 mph. are attained.

New Haven Using Ballast Cleaner

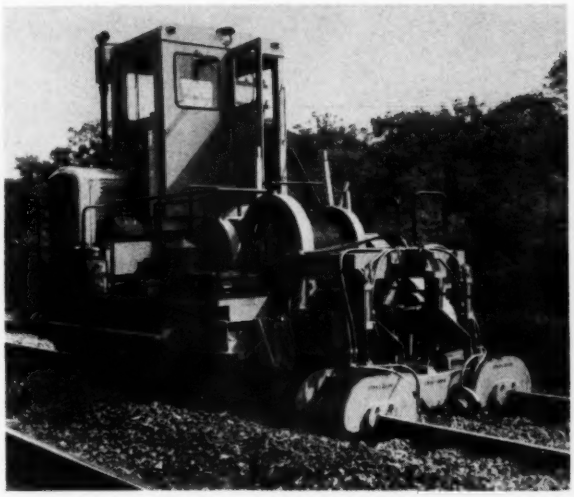
A separate winch car, which hydraulically clamps itself to the rails, is pulling unit for latest version of Pullman-Standard's ballast cleaner. The combination, presently in use on the New Haven, features auger-type ballast collector plus several other innovations.



Close-up view of the auger-type ballast collector. Ballast is drawn by the auger into the enclosure at the right and carried up by the elevators



This revolving dirt lift wheel carries the dirt seperated at the screens up and onto the conveyor belt



The winch car is equipped with dual hydraulic rail clamps which secure the unit to the track while pulling the cleaner unit

The cleaner unit in operation. Augers collect ballast at the sides of the machine as it is towed via the cable at the left

With New Features

• Cleaning of the ballast on 12 miles of main-line track on the New York New Haven & Hartford is now being carried out with the latest model of the Pullman-Standard Power Ballast Cleaner, which incorporates a number of important improvements as compared with earlier models. The new units are being used to clean stone ballast between New York and Boston over which the "crack" New Haven trains operate.

The cleaner unit is designed to pick up dirty ballast simultaneously from both shoulders of a single track or the shoulder and part of the "six-foot." According to the manufacturer, the Pullman-Standard Car Manufacturing Company, Chicago, the unit is capable of cleaning the dirty ballast and redepositing it on the track at a rate of 1,000 to 1,250 ft. per hour. When working at locations where the track has been previously cribbed the machine is said to have the capacity to clean both the shoulder and the cribbed ballast at a rate of 600 to 800 track feet per hour. The cleaner is said to dig out shoulder ballast to a total depth of from 8 to 10 in., depending upon whether the ties are 8 ft. 6 in. or 9 ft. in length.

Several New Features

One of the most important new features of the improved ballast cleaner is the addition of a winch car which is said to provide positive, variable speed propulsion of the ballast-cleaner unit. The winch car, which weighs 29,800 lb., is operated by one man, and is propelled by a 40-hp. diesel engine, runs ahead of the cleaner, unwinding cable for a distance of 500 ft. The car is then anchored in place with hydraulic rail clamps and proceeds to pull the cleaner toward it. The rail clamps have been designed so as not to slip on greased rail even when the full load of 30,000 lb. is applied to the car through the cable. In case the cleaner unit should strike a submerged obstacle in the ballast, an electric slip clutch safety device on the winch car automatically prevents the tension in the cable from exceeding 30,000 lb., even though the breaking point of the cable is 60,000 lb. As an additional safety feature, the winch car is equipped with a hydraulically-actuated over-center mechanical track lock or safety hook, which is designed to hold the car in place in the event that the rail clamp should fail for any reason.

New Cleaner Design

A new design feature of the cleaner unit is the auger which breaks up the cemented ballast and carries it back to the elevators in the same manner as a wood auger carries chips out of a hole. Another noticeable change in the cleaner design is the use of a revolving lift wheel which carries the dirt ejected from the shaker screen to a top-mounted belt conveyor which disposes of it. The top position of this conveyor system is reported to permit complete flexibility of adjustment of the distributing mechanism for the cleaned ballast—allowing it to be placed on the track at any desired location.

The dirt conveyor is hydraulically-operated from the cab by the operator who can swing the conveyor to any position in a 140-deg. arc. In this manner, dirt can be wasted over the bank, over the second track to the opposite shoulder, or into a car behind the cleaner unit as may be desired.

Two Engines Used

The new cleaner weighs 80,800 lb., and is powered by a 150-hp. diesel engine which drives the elevators, digger section, dirt belt conveyor boom and the hydraulic system. An additional 40-hp. diesel engine drives the vibratory screen and the dirt lift wheel. One or both elevators can be lifted by either engine for clearance whenever necessary.

Both the winch car and the cleaner are self-propelled, having a running speed of 25 mph., and either unit can tow the other when traveling. In addition, each is equipped with a powered lateral set-off mechanism. It is expected that the railroads will find various uses for the winch car as a separate unit when not employed with the cleaner in connection with the ballast-cleaning operation.

EXPERIENCE in carrying out an annual program of planned maintenance for 10 years has demonstrated to Erie officials that GOOD **TURNOUTS**—the marks of a well-maintained yard—can best be obtained by raising ladders systematically on good timber

How to Get Better Yard Maintenance . . . On Normal Budgets

For adequate maintenance of a yard you don't have to have new rail, new switches, stone ballast and hordes of men, but you do have to use good judgment as to where to work, what to do and how to do it with the best materials available. At least these are the conclusions reached by the author of this article.*

By Malcolm E. Condon
General Yard Foreman, Erie
Jersey City, N. J.

• The essential standard of maintenance in yards is that which is adequate for the safe operation of trains and the safety of employees. To provide the first, a basically good, but not necessarily new, track structure is necessary. To secure the second, the "good housekeeping" must be well-nigh perfect. To obtain each, a planned program is of major importance taking into consideration the relative importance of respective yard areas and individual tracks.

In yard areas the turnouts are the weakest links in the maintenance chain. As such they must receive preferred attention. Switch timbers should be renewed before they become poor. Switch points and frogs must be kept in repair by welding, or renewed when worn beyond economical repair. Above all, correct gage throughout the turnout must be maintained at all times. The use of secondhand 130-lb. or 131-lb. tie plates under 100-lb. or 110-lb. rail in turnouts will help materially to hold the gage, particularly on the curved side of the turnout, and just ahead of the points. This can be done by punching one additional hole on the gage side of these larger plates to make them fit the lighter rail sections which have only a 5½-in. wide base.

The use of manganese-steel self-guarded frogs is a very important factor in reducing routine maintenance. Of simple construction, with a minimum of bolts, these frogs have an extended life, and eliminate the necessity for separate guard rails. The regular application of a relatively heavy grease, such as Texaco No. 904, to the guarding flanges of the frogs reduces abrasion and extends their service life.

Reduce Switch Point Wear

Manganese switch-point protectors insure additional service life, particularly to open-hearth switch points. The use of grease applied to the tips of switch points will reduce wear and lengthen the cycle of repair by welding. A careful study of traffic conditions in a yard area will point out certain switches which bear a high percentage of the daily train movements. Such switches should have the point protectors installed on the curved (diverging) side. The investment will be returned threefold by extending the life of the switch point in the track, by reducing the need for frequent building-up of the tip by welding, and by thus providing safer train operation.

Switching leads are the next tracks to be considered, particularly those at "humps", or in other classification areas. Whether tangent or curved, such track sections have such heavy use that the best possible degree of maintenance must be provided to eliminate the possibility of delays in train operation.

Next in order of importance come the curved portions of yard tracks. Here, adequate tie renewals are imperative to hold the gage. Rail in these curved sections of track should also be renewed before it becomes poor, and joint bars must be kept tight.

* Originally presented as a discussion in the What's the Answer department, but withheld for use in the feature section because it discusses methods that have been used with good results for seven years in a major terminal.

One of the ways in which switch-point wear can be materially reduced is to apply a relatively heavy grease to the points

Manganese switch-point protectors also minimize switch-point wear by deflecting wheel flanges away from ends of the points

The maintenance of tight joint bars throughout yards is of vital importance. The track bolts on every active track turnout should be tightened at least once a year. At that time the joints should be painted or sprayed with black oil. The bolts in frogs, guard rails, switch points, switch-point protectors, etc., should also be tightened at similar intervals and these track units protected with an application of black oil. It is best to set up a definite program for bolt tightening, using a power bolting machine to the greatest extent possible in doing the work. In this way you can assure complete coverage of the tracks within the period of a year—or whatever cycle of frequency the particular conditions may dictate.

Tie Renewals Important

Next in a maintenance program will come the repair of active tangent yard trackage, with tracks having greatest use coming first on the program. Some tracks are used to assemble "haul", or make up "branch-line" way freights. These tracks are more important than others, such as "hold" tracks, or storage tracks, and should be scheduled first in a yard track reconditioning program.

In many cases 80-lb. or 90-lb. rail in such tracks is entirely adequate, but the bolts may have become loose, the bars badly worn or broken, and ties badly cut for lack of tie plates. Very often such tracks can be placed in safe operating condition with a minimum of expense by raising the track, installing secondhand ties and tie plates, and renewing joint bars and bolts.

In all of this yard maintenance work involving renewal of ties and timber, an out-of-face raise of the track is usually the most economical method to employ. This is particularly true where heavy renewals are encountered, and the operating department should be asked to block the track daily during the work period. This method of work gives a highly productive eight-hour day. It eliminates all the waste effort involved in making runoffs during the day and in keeping the track safe for yard moves which are often exceedingly difficult to anticipate. It permits an orderly distribution of materials in advance of the work, and simplifies the loading of released materials for removal at the end of the day.

An even more ideal situation exists where a track can

Self-guarded frogs reduce routine maintenance because they eliminate guard rails and have very few bolts to keep tight

be kept out of service for a full work-week—particularly an "interior" yard track, to which access is restricted. By removing the track from service, it is possible to use a crane and load all necessary ties and other material on a flat car and spot this car on the track to be raised. Material can be unloaded as necessary and the car moved along as the work progresses. Another flat car can be placed at the other end of the work area and old ties and other released material loaded on this car each day, keeping the pathways clear. In this manner labor is reduced to a minimum in handling material and moving it to the point of use, and in removing the released material for ultimate disposal. Runoffs are eliminated, material—handling costs are minimized, train delays are negligible and a very efficient operation results.

By contrast, the raising of ladder tracks normally must be conducted under traffic and results in proportionately larger expenditures of man-hours. However, the net result of raising ladders amply justifies the cost. Timbers are renewed easily. Good gage and alinement can be established more readily, and tie plates and spikes renewed quickly. Correct gage and good surface

through a turnout or along a ladder will compensate for minor deficiencies in the metal materials of the track structure. Even an 80-lb. or 90-lb. turnout looks good and "rides" well when the timbers have been renewed, the track raised, the bolts tightened and the switch points and frog built up by welding whenever necessary.

As a ladder track is raised, a runoff must be made on each successive track. This gives an opportunity to renew the ties and regage and resurface perhaps 100 ft. of each yard track behind the frog. If tie conditions or gage are particularly bad beyond this 100-ft. runoff, it is a simple matter to raise additional trackage to correct the condition. Of course, the foreman will often say—"Where shall I stop?" or "There are a lot of bad ties beyond this point." Naturally it becomes necessary to set arbitrary limits for the track raising in making the runoff from the ladder, with the knowledge that the remainder of the track (or tracks) will be raised throughout their length on a succeeding work program. Very often yard tracks, particularly off switching ladders, have curved portions immediately behind the frog and continuing for perhaps 300 or 400 ft. When gage conditions indicate the need, it is well to include the raising of this section of track with the raising of the ladder.

Another advantage often to be considered in raising a section of yard track is the opportunity to "bury" spilled lading, such as coal, stone, sand, granulated roofing slag, coke and similar bulk commodities subject to leakage from cars. In classification yards it is necessary to clean certain tracks at least once a year to keep such debris below the top of rail. When a track in this condition can be raised, it gives an opportunity to pick it up on such material which, in the majority of cases, proves entirely adequate as ballast. Pathways can also be cleared between tracks on such raises and the material placed in the ballast section. Better drainage results, increasing the life of the ties, and giving greater stability to the track structure.

Raising yard tracks not only simplifies the installation of ties but also cleans up the yard by burying "car droppings"

Program Metal Renewals

The renewal of metal materials in yard maintenance should be set up in definite programs. It is very advantageous to carry out such work in conjunction with track-raising programs, particularly where an extensive tie plate renewal is involved—either in first application or straight replacement. After the metal material has been installed and the track raised, with ties and timber renewed and respaced and tie plates added as necessary, that particular track will remain in safe operating condition for many years with very little, if any, section maintenance required. Released rail and angle bars can often be reused to patch other tracks which are included on the track-raising program, but not involved in an out-of-face renewal of the rails.

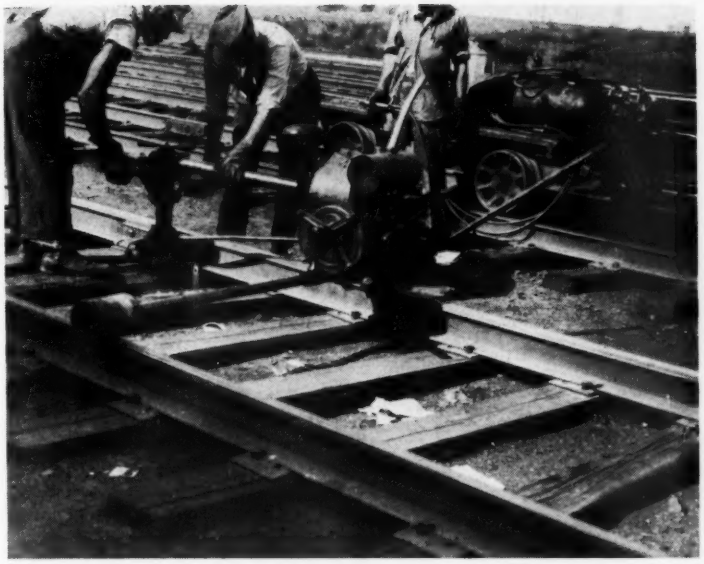
Turnout materials are usually best renewed as units. When an 80-lb. or 90-lb. turnout needs to be renewed, it is advisable to renew the entire turnout with 100-lb. or 110-lb. material. However, if the turnout is already 100-lb. or 110-lb. it is frequently only necessary to replace a portion of the turnout in kind. Installation of new switch points and frogs requires the renewal of abutting rails, stock rails, etc. It has been found that good 110-lb. RE relayer rail fits very well against new 100-lb. RA switch points and frogs, with very little need for building up the adjacent rail-ends.

Switch points should be built up by welding as frequently as necessary to maintain them in safe condition. In larger yards, a welder and helper can be employed almost continuously on such a program. Such work pays off in extending the life of the switch points, thereby reducing the frequency of replacement. To keep a given point in service until it is worn out throughout its length is ideal. Too often, for lack of welding, a point is just worn badly for 18 in. or so at its tip, with a good head section still existing. A constant check should be made of switch-point wear, and welding should be programmed while there is still ample parent metal to form a strong bond with the weld metal added. To facilitate program welding of points, zones of operation should be established. Under that system a welder covers all the switch points in a particular zone, building up any that are found worn, before moving to another zone of the yard. Naturally some switch points wear more than others, and the frequency of building up such points becomes a variable which can only be determined by continued field inspections.

Preventive maintenance in the form of building up yard switch points is definitely a good investment. When you compare the cost of a welder and helper building up a point in about one hour with the cost of a foreman and four to six men spending at least two hours renewing a point (and perhaps the stock rail) because it was not built up when such work was necessary, you can see very definite savings in labor and material.

Clean Up Daily

"Good housekeeping" is an important factor in a properly maintained yard. This can start with maintenance-of-way materials and supplies. Such material should be properly segregated, neatly piled and clearly identified. Metal materials should be protected from rust and corrosion to the greatest extent possible. New frogs, switch points, guard rails, switch stands, switch plates, braces, and similar items should be coated with black oil upon arrival at the storage point. The establishment in a large terminal yard of a centrally located storage point for rail, turnout material, track fastenings, oil, salt, tie plugs, tie plates, and switch timber gives a



Program of tightening and renewing bolts can be carried out on a highly desirable one-year cycle if a bolting machine like the Raco is available.

Well-kept storage yard, preferably near a toolhouse facilitates accurate control of materials.

better control of the material. An ideal location, for such a storage point, when a locomotive crane is available for unloading, is adjacent to a section toolhouse, with two storage tracks available for the material handling. The cars to be loaded or unloaded can be placed on one track and the crane operated from the adjacent track. There should be ample storage room for the separation of materials and their proper arrangement. By having the storage point close to a toolhouse, that particular gang can be responsible for the storage, piling and general appearance of the area. Men will be readily available for the unloading operation, and when completed, can return to normal maintenance work with a minimum of lost time.

Crane a Necessity

The availability of a locomotive crane, or similar unit, for material handling, is vitally necessary to reduce to an absolute minimum the manual handling of material. The banding of new side-track ties and timber being sent into terminal areas will facilitate unloading and reduce the labor cost by at least half, as compared with unloading and piling by hand. The hazards of such manual unloading and handling are also eliminated and the chance of an accident or personal injury reduced considerably. The use of a magnet with the crane in handling metal materials, such as tie plates, angle bars, switch plates, rail anchors, spikes, and bolts, and the loading of miscellaneous small scrap will save many man-hours, will result in more prompt loading or unloading of cars, and will provide a safer operation. Actual experience shows that the locomotive crane, with a magnet, and with the crane engineer, conductor, assistant foreman, and one trackman, will load in one hour as much small scrap as could be loaded manually by a foreman with four men in eight hours and with far less chance of injury to the hands, toes, feet, etc. of the workmen.

It is necessary to maintain emergency stocks of metal materials at section toolhouses throughout the terminal yard area, but such materials should be kept at minimum requirements. The necessary materials for programmed out-of-face track work should be drawn from the central storage point, and handled by the locomotive crane (equipped with magnet) to the greatest extent possible. To keep rehandling and distributing costs to a minimum, such material, including ties and timber, can be brought to the nearest point available for unloading and use at the work site.

Maintain Order

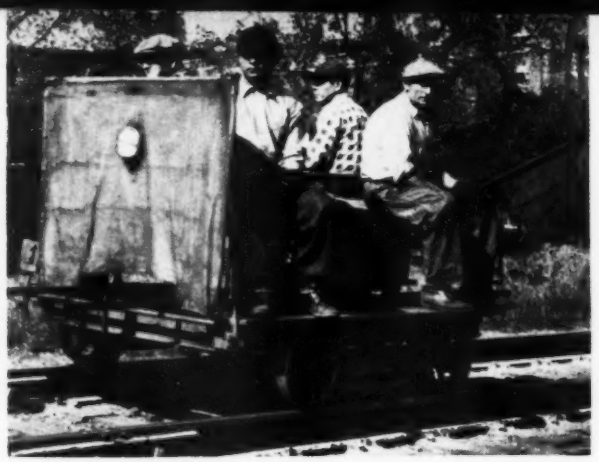
After new and secondhand materials have been properly stored, the orderly disposition of released materials should be established. Scrap ties and timber should be removed from the work areas each day and piled for burning or for sending to disposal areas. Scrap rail and other metal materials should also be removed to section scrap piles at the end of each day's work, and the work area cleaned up, tie cribs leveled, and pathways cleared. In other words, each day's work should be a separate job in itself with each and every one of the attendant phases of the work completed by the end of the day.

"Good housekeeping" is usually contagious. If the M/W forces do a good job of keeping their materials and work areas in proper order, other employees will normally follow suit. If they do not accept the challenge to "clean up," their failure to do so is usually so self-evident that official action follows.

Most railroad employees have a potential pride in doing their jobs well. Our maintenance forces are not exceptions to this generality. Adequately maintained yard areas naturally encourage men to do their best—ever striving to improve the established maintenance standards, keeping the tracks safe for train operation and their respective sections as neat and orderly as possible, consistent with the conditions encountered.

No maintenance office should ever doubt that an adequate standard of maintenance in yard territories pays ample dividends. Such a maintenance standard permits the establishing of yard-work programs which can be progressed efficiently, at the lowest possible unit costs and the greatest possible utilization of materials, machines and men. It's all worth it.

PATROLLING TRACK
By Whom and How Often?



Patrolling track with an entire section gang is still widely used, but is being rapidly superseded by more economical methods

The problems involved in getting proper track inspection, and the effect on them of the 40-hr. week, along with other phases of the subject, are discussed in this article which is based on an address presented before the recent annual meeting of the Roadmasters and Maintenance of Way Association.

By R. G. Simmons
General Roadmaster
Chicago, Milwaukee, St. Paul & Pacific—Chicago

• Over 50,000 motor cars are in daily service on the railroads of this country, practically all of which are devoting full or part time to the never-ending job of patrolling track. As a means of illustrating the magnitude of this operation, let us assume that each of these cars travels an average of ten miles per day. We then find that over one-half million miles of track are patrolled daily—a big job in any man's language.

The question of by whom and how often track should be patrolled very likely has as many or more answers than any other subject related to track maintenance. I find in checking the records that there are literally dozens of methods of handling the job. I do not profess to know the right answer, but will attempt to cover the subject in the hope that the presentation of the overall picture will be helpful to those desiring to improve their methods of patrolling track.

Early History

In the early days of railroading many of the problems encountered in connection with track patrolling were far different from those which confront us today. The pioneers of our profession soon discovered that it was necessary to have someone inspect the track frequently to insure the safe operation of trains. I am told that the practice of inspecting or patrolling track was established and was very likely first handled by men on horseback or track walkers who were assigned to a definite length of track which they covered at designated intervals. These men reported their findings to construction foremen or supervisors in a manner very similar to the present-day method. Eventually these men were provided with hand cars and subsequently with modern motor cars.

Track patrolling on most railroads is usually handled either by the section men or by a track patrolman whose only duty is the inspecting and patrolling of track. Whichever method is used, great care must be exercised in the selection and education of the man or men whose job it is to carry out this task. Whether he is to operate alone or is to be accompanied by others, it is important that he be mentally alert, have good eyesight, hearing, a knowledge of operating rules, and above all else, a desire and willingness to abide by all safety and operating rules.

One of the paramount requisites of the efficient trackman is that he be thoroughly familiar with, and as well schooled as possible in, the basic principles of track construction and maintenance. He should also have good judgment, foresight, and experience so that he will be able to give precedence to the more important items of work. He should be thoroughly familiar with the maintenance of frogs and switches so that he will be able to detect at a glance if anything is wrong and, if emergency repairs are necessary, he should know all the short cuts in making them. Any defects found must be corrected without delay. Failure to do so will defeat the whole purpose of the inspection and might lead to the delay of one or more trains.

Proper Tools Necessary

In addition to his personal qualifications, the man making the inspection must have the proper tools. These include a good motor car of the proper size, which must be maintained in the best possible mechanical condition at all times, and which must include all safety features and be equipped with a full set of flagging equipment. The number and weight of track tools that a track patrolman carries should be held to a minimum and should be basically selected for the purpose of making emergency repairs.

So that all motor-car miles can be safely traveled much thought must be given to the proper operation of motor cars. On most railroads definite instructions are in effect to govern the operation of motor cars over the various types of highway crossings to the end that there will be no misunderstanding of the procedure to be followed. There must also exist a definite understanding as to how motor cars will be operated to protect them from trains.

Methods Vary

In checking the records, I find that most railroads have sections averaging in length from 5½ to 30 miles of single track. However, the 30-mile sections are rare and most sections do not exceed 20 miles in

Many advantages are claimed of this method of track inspection where the section foreman is accompanied by only one other member of his gang

Track patrolmen, equipped with modern, light motor cars, are now used extensively for district patrolling

length where they are patrolled by regular section gangs. The method, frequency, and time of patrolling sections varies on different railroads and with the types of track to be inspected, and depends upon the track structure, surrounding terrain, density of traffic, weather, and local conditions.

We on the Milwaukee have track that runs through gumbo and unstable country where we find it necessary to patrol daily. We also have track subject to being fouled by falling rocks, which must be patrolled each day. In some instances and at certain times of the year we maintain track walkers who cover short stretches in certain areas to protect against rocks and slides. However, much of this territory is now protected by slide detector fences that are connected to the signal system, thus eliminating the necessity for patrolling these stretches. We likewise have bridges that are wired to the signal system in such a manner as to prevent train movements over them in the event of fire.

In territories where we have heavy-duty track we feel that frequent track patrolling is not justified under normal conditions. On many of our branch lines which carry only one train a day or perhaps accommodate tri-weekly service, we find that the patrolling can be reduced to a minimum of possibly one or two inspection trips per week.

Two Types Necessary

There are two separate and distinct types of patrolling necessary on most all railroads. One type is used on the outlying or "country" section—the other on the terminal or yard sections. A person patrolling either of these sections has basically the same things to look for. However, the patrolman on outlying sections usually has better track to inspect and, since it is stretched out in one long piece, he can, as he rides along, note the surface, line, gage, and condition of the joints, switches, highway crossings, signals, culverts, bridges, fences, telegraph lines, and buildings. The yard or terminal patrolman must also look for all of these things, but his territory is usually much smaller, and much of his patrolling is done on foot. A more detailed inspection of switches, rail, gage, interlocking plants, clearances, etc., is necessary because of the much heavier traffic which is handled through such sections and which causes the track structure to wear out faster.

We employ terminal patrolmen in some of our large terminals where the traffic is heavy and the territories are large. These men also cover the multiple main lines which are under the supervision of the terminal gangs that have in their territory both main-line and yard trackage. We feel that the general foreman is thereby relieved of some of the time and responsibility of inspecting his main-line track as frequently as is necessary.

By Whom?

On the majority of the railroads today the bulk of the track patrolling is handled by the section crews. These crews sandwich their patrolling duties in with their other work, and the exact method of handling the job depends entirely upon the track supervisor. With good planning between himself and the section foreman many dollars can be saved on the patrolling operation. As we all know, the tendency has been to lengthen sections in recent years and that excessive time is required to patrol these long sections. Therefore, one of the systems now in use on many railroads is for the foreman to assign certain duties to all of the men in his gang with the exception of one man who accompanies the foreman on the motor car throughout the inspection trip.

The track walker is indispensible for inspecting track in terminals, yards, and other congested areas where motor car operation is impractical. His tools should be selected for emergency repairs

At best, this method necessitates a lot of motor-car travel and consumes a good many hours of the section gang's time. Now that all section crews are on a 40-hr. week, the patrolling problem becomes one of paramount importance and as such must be given a lot of study. Several leading roads have installed regular track patrolmen who cover 50 to 75 miles of track on a light motor car. This method relieves the regular section crews of this work except possibly on the patrolman's off days. This system has many good points. First, it relieves regular section crews of this work, thus enabling them to devote their entire time to their other work instead of riding up and down the track.

Second, it establishes a training spot for future supervisors. The men picked for this job are chosen

with this thought in mind—that they will eventually become supervisors. They are given sufficient authority so that they can place or remove slow orders and move the regular section crews from one type of work or place as conditions may necessitate. It trains these men in the handling of men and in the execution of various types of work. In other words it educates them to take over a position as roadmaster or supervisor when the opportunity presents itself. Most of these men are taken from the section ranks where their background is confined to one or two sections but upon being appointed to this type of job, their scope of activity becomes much larger and they have the benefit of studying the practices of several foremen. In addition, it gives management a wonderful opportunity to test and study their future supervisors.

District Patrolling

In the last four or five years, another method of track patrolling has been started on some railroads, which is very similar to the above-mentioned system, the only difference being that with this method the section crews are abolished and district gangs are established. These consist of gangs of about 15 men, equipped with trucks or motor cars, which maintain the track in lieu of the old style section gang. In connection with this type of gang, the track patrolling is usually done by one man on a small motor car who usually covers approximately 50 miles of track. This man has the authority to call on a small unit or the entire district gang organization to take care of emergency work. This method of handling the inspection work has the advantages that a qualified patrolman goes over the track more frequently than is possible with other methods and is able to establish a better program of work. I believe that the railroads that are so located geographically that they can inaugurate this type of track maintenance have been able to take a step forward that will result in many benefits.

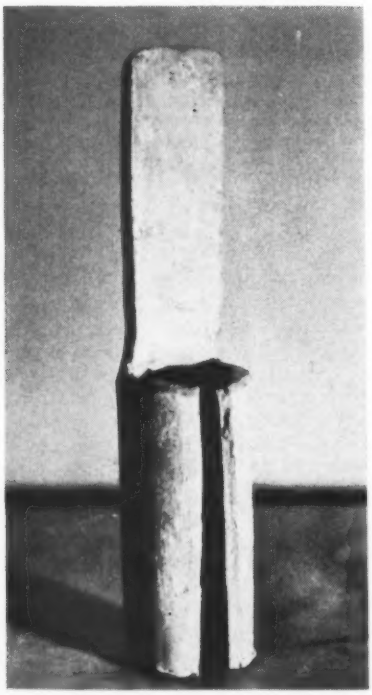
That type of track patrolling necessary in emergencies, such as heavy storms or extreme weather conditions, is likewise too important to overlook. All railroads have instructions calling for emergency inspection and most roads are like the Milwaukee in that on certain territories it is felt necessary to patrol the track during extremely cold weather. This type of inspection depends entirely upon local conditions and should be handled accordingly.

As a result of the change-over in recent years from steam to diesel motive power on the majority of railroads, we find that we are confronted with a track condition that is not new but which seems to have grown with the increased use of diesel power—engine-burned rails. While it is true that all diesel locomotives are equipped with wheel slip indicators, engine burns remain a common occurence. So we find that, even with the most modern motive power, it is still necessary for us to patrol the track.

Thus, we can readily see that the basic practice of patrolling track has not changed appreciably in the past 100 years, and I find that I am continually asking myself if we are getting the full value out of the dollars we spend on this operation.

Make Both Ends of Brooms Work

By A. Drager
M/W Storekeeper
Central Railroad of New Jersey
Elizabethport, N. J.



This steel scraper, made from standard 1-in. pipe, can be reused after the broom to which it is attached is worn out

• Every snow broom used by a trackman for removing snow, ice and dirt from switches, frogs and guard rails should be equipped with a steel scraper to clean out the opening between stock rails and switch points and from the flangeways of frogs, guard rails and highway crossings. Without a steel scraper, the snow, ice and dirt cannot be thoroughly removed from the corners. If additional snow and ice freezes on top of the old, it will be difficult to get it cleaned out. Furthermore, without them, the work is much slower and more expensive.

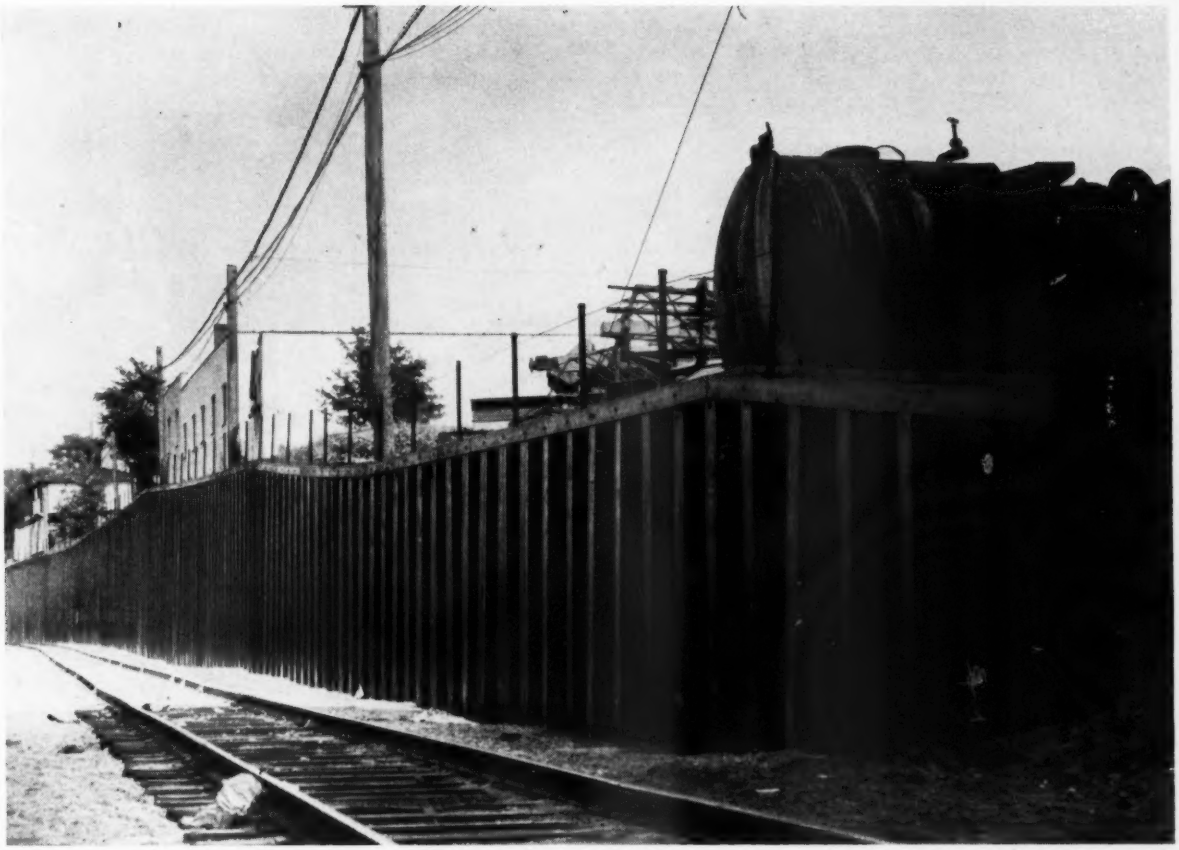
In past years it was not difficult to obtain snow brooms which had steel scrapers inserted into the ends of the handles. These scrapers were satisfactory, but when the brooms were eventually discarded, the steel scrapers were also scrapped and so became an economic loss.

Several years ago one of the section foremen of the Central Railroad of Pennsylvania at Ashley, Pa., made a steel scraper out of a short piece of pipe and fitted it over the end of the broom handle. This scraper is about 7 in. long, made out of 1-in. diameter pipe, $\frac{3}{16}$ in. in thickness. The bottom part is split open so that it can slip over the broom handle and the top part is flattened out and made into a chisel point suitable for scraping. When driven onto the end of the broom handle, the split bottom can be squeezed until it fits like a glove and will not give way when being used.

When the snow broom is worn out and discarded, the steel scraper is salvaged and attached to another snow broom. If the chisel point has become dull it can be reground and re-used for many seasons at a savings in comparison with the old method.

We have found that these points make a troublesome task much easier and provide substantial economies in time and expense when switches, frogs, and guard rails have to be cleaned of snow and ice. Costing only about 35 cents, they have been found to be an exceptionally good investment.

This article was originally presented as a discussion in the What's the Answer Department. It was withheld for use in the feature section because it was both timely and comprehensive.



Two additional yard tracks were made possible to the CMStP&P through the construction of this steel sheet-pile retaining wall in a congested district in Milwaukee, Wis. The wall is 1,127 ft. long and its top follows the general ground contour

Retaining Wall Features Good Drainage

Milwaukee road uses a combination of open gutters, downspouts, sand drains and asphalt-coated corrugated iron pipe to intercept surface waters and to carry away sub-surface drainage from long sheet-pile retaining wall.

• To anyone looking only at the station grounds map showing the facilities of the Chicago, Milwaukee, St. Paul & Pacific at Milwaukee, Wis., it might appear that there would be plenty of room in which to build two additional yard tracks, but on the ground the reason why these tracks weren't built a long time ago becomes apparent—there is a large hill there. And that was the situation the road faced when it wanted to enlarge its Air Line yard at that point. The purchase of additional property to permit the hill to be cut back on a slope was out of the question because this location is in a congested industrial area. So the construction of a long retaining wall was the practical answer to the problem and the road's decision.

Plans prepared by the railroad called for a retaining wall 1,127 ft. long, extending generally in an east-west direction, with the top following the contour of the ground and ranging from 1.5 ft. to 19 ft. above the base of rail of the proposed yard tracks. At the east end, the plans called for 184 lin. ft. of creosoted pile and timber retaining wall, where the height ranged from 1.5 to 5 ft. West of this was a section of steel-pile wall of the cantilever type for the next 219 ft., where the height varied from 5 to 11 ft. For the next 628 ft., where the wall height varied from 11 to 19 ft., was a section of steel sheet-pile wall braced with steel piles driven behind the face at a 60-deg. angle downward from the horizontal and welded to the vertical sheet piles. The next (westerly end) section was also of the cantilever steel sheet-pile type where the height dropped to 8.5 ft. before sloping sharply down to 1 ft. at the extreme end.

Procedure of Work

After the wall location had been staked out, a bulldozer and a crawler tractor with a front-end

shovel made a sidehill cut about 4 ft. deep to provide access for the five crawler cranes that were to be employed on the construction of the wall. One crane worked on the timber-pile section, two others on the cantilever-type steel sheet-pile section, and two more on the braced steel sheet-pile section. All piling was driven by steam hammers held in suspended leads. In addition, each of the three sections was served by a boiler for furnishing steam for the pile-driving hammers.

The construction of the creosoted pile-and-timber section was carried out in the conventional manner. Timber piles, 20 ft. long, were driven at 3 to 6 ft. centers, as required by the wall height, were cut off and capped with a timber, and were backed up with 4-in. by 12-in. planks.

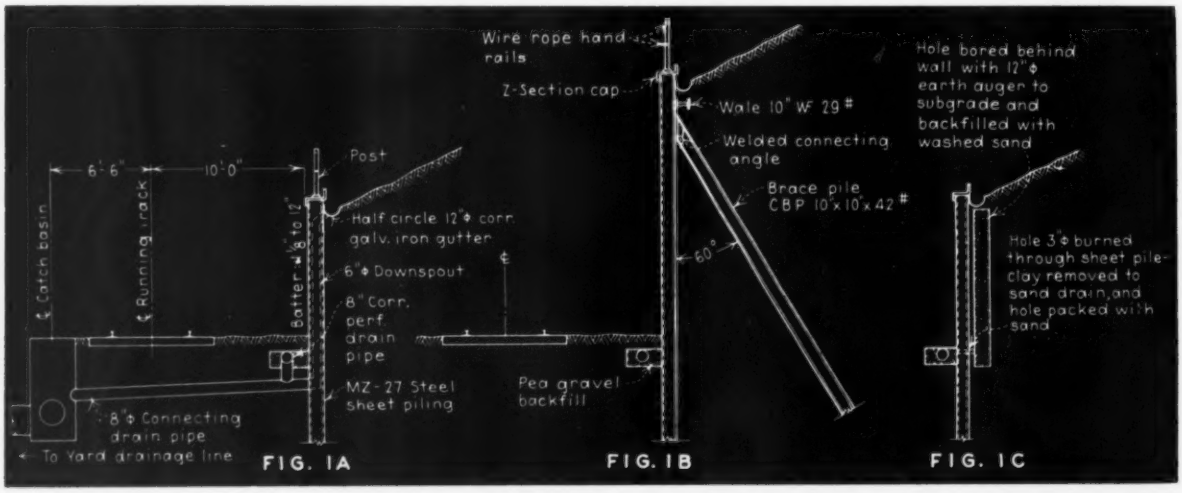
Two Hammers Used

For the cantilever-type section, MP-115, I-27 and MZ-27 steel sheet-pile structural shapes were used. One driver crane, equipped with a No. 8 steam hammer, started the piles on their downward course, and another crane, equipped with a No. 2 steam hammer, finished the driving. Where the sheet piles changed in section, and hence were incapable of being interlocked, the sections were lapped sufficiently to permit tack-welding them together. The piles were driven in such a manner that they would have more than 60-per cent penetration below the base of rail of the proposed tracks.

In building the braced-wall section, the procedure was somewhat different. An earth auger 12-in. in diameter was used to bore starting holes at the correct angle for the brace piles. The auger was air powered by a gasoline engine-driven compressor and worked in a guide held in place by one of the cranes. The brace piles were 10-in. wide-flange H-beams, ranging from 32 to 42 ft. in length, but were spliced in some instances to make piles as long as 54 ft. These piles were driven by a No. 1 steam hammer operating in 60 ft. leads held at the top and bottom to the desired driving angle by two cranes. They were spaced 3-ft. 6 in., and 4 ft., and 5 ft. apart, the closer spacing being used on the higher portions of this section.

After the brace piles were driven, two cranes, with one starting the driving and the other finishing, drove the vertical sheet piles to a backward batter of ¾ in. to 1 ft. As this work proceeded, the tops of the brace piles were torch-cut verti-

After holes were started with an earth auger, the brace piles were driven by a steam hammer working in suspended leads held to the desired position by two cranes



Careful consideration was given to obtaining good drainage. Gutters were installed at the toe of embankment along the top of the wall to intercept surface waters and downspouts were placed at intervals to carry it down to subsurface lines. Also, holes, backfilled with washed sand, were bored behind the wall to intercept seepage and lead it to underground drains

ADDITIONAL INFORMATION

On Any of the Products Mentioned in This Issue

Below is a complete index of the products referred to in both the editorial and advertising pages of this issue. If you desire additional information on any of them, use one of the accompanying addressed and stamped postcards in requesting it. In each case give name of product and page number. The information will come to you directly from the manufacturer involved, without any obligation on your part.

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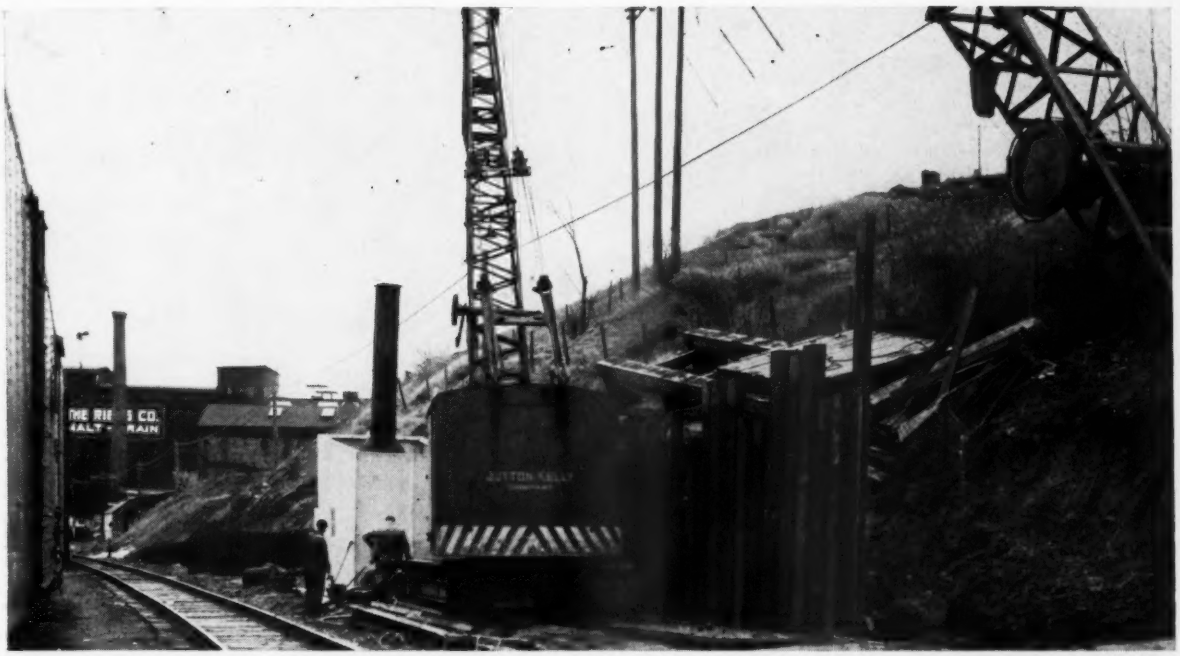


A creosoted pile-and-timber retaining wall was built at the east end where the height of the embankment being held back was low. The small building with stack shown behind the crane housed a boiler for furnishing steam to a steam hammer

cally to fit up against the backs of the sheet piles. The top of each brace pile was then fastened to the sheet pile by welding short pieces of steel angles to both. The brace piles had been so driven that, when cut to fit against the backs of the sheet piles, they came about 3 ft. below the top of the wall which, in general, followed the contour of the ground. A crew of men followed behind this work and, using U-bolts, attached 10-in. wide-flange structural steel wales along the backs of the sheet piles just above the brace-pile connections. Then dirt was removed from the front of the wall down to grade.

The sheet piles on both the braced and cantilever sections were driven with their tops a little high so that they could be torch-cut to form a uniform line for the top of the Wall. A Z-section cap was then placed over the top of the wall. Bolts were used for its attachment to the front of the wall and, in addition, its was tack-welded in the rear. A handrail was built over the entire length of the wall, the posts for which were spaced approximately 10 ft. apart and bolted to the cap. Two ⅝-in. wire ropes were used for this purpose.

Handling of Drainage

It is one thing to design and build a sturdy retaining wall, but it is quite another to assure its continued stability. Realizing that good drainage would be an important factor in assuring the stability of this structure the Milwaukee designed a system not only to intercept surface waters but also to collect and lead away subsurface waters and any seepage which might occur.

An 8-in. line of asphalt-coated corrugated perforated galvanized iron pipe was installed along the foot of the wall's face for its entire length, and the trench was backfilled with pea gravel. This line was divided into six separate sections or zones, each draining toward and connected with a separate catch basin in the general drainage system of the new yard.

Behind the steel sheet-piling sections, vertical holes were bored 12 ft. apart with a 12-in. earth auger to about 1 ft. below the subgrade level of the adjacent yard track, and these holes were backfilled with washed sand. These formed vertical sand drains to collect seepage water from the soil laminations in the hill. At each of these sand-drain locations, 3-in. weep holes were torch-cut through the face of the sheet piles at about subgrade level. They clay soil between the sheet piles and the vertical sand drains was removed and the holes were packed with washed sand, thus providing an outlet through which the waters captured by the sand drains could flow to the perforated pipe line which had been laid at the foot of the newly constructed wall face.

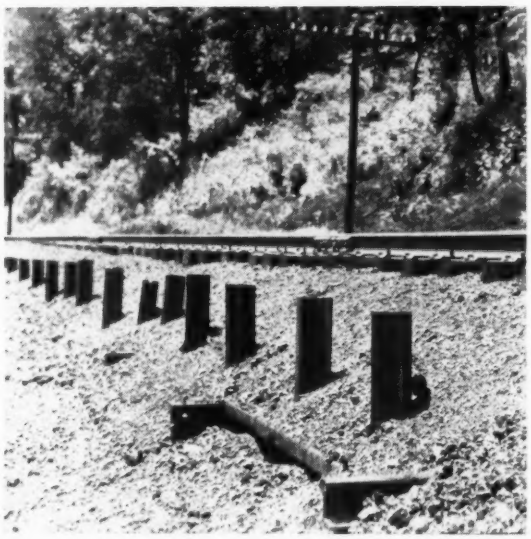
To intercept surface drainage from the hill slope, a half-circle gutter of 12-in. asphalt-coated corrugated iron pipe was laid along the rear of the sheet piles and bolted to it just below the wall cap. Opposite each catch basin of the drainage line located at the foot of the wall, a corrugated iron downspout was dropped from the gutter. The downspout passed through the back face of the sheet piles at an angle, then dropped vertically in the recess of the sheet piles to a horizontal connection with the catch basin.

Work Done in Winter

Construction of the wall was carried out during cold weather, this being necessary to meet the road's schedule for the completion of yard improvement work. Work on the wall was started in November 1951 and was completed in February 1952 by Jutton-Kelly Company, contractors, Milwaukee, Wis. The work was done under the general direction of W. G. Powrie, chief engineer of the Milwaukee. The wall was designed under the direct supervision of B. J. Ornburn, assistant chief engineer, structures. Field work was under the direct supervision of K. L. Clark, principal assistant engineer.

Aerial view of the Southern's new Ernest Norris Yard located at Birmingham, Ala., showing cars going over the hump into a 56-track classification yard. The West departure yard is at the extreme left and the East departure yard is at the right and has two long tracks connecting with the main track to Atlanta, Ga. An unusual feature is having a bridge on the hump lead which carries the lead over two tracks which are used for movement from one side of the yard to the other without interrupting hump switching. This new terminal is equipped with the latest devices and communication systems, and includes automatic switching, car retarders, an electronic track scale, car-repairing facilities and a diesel locomotive shop.

News Briefs In Pictures . . .

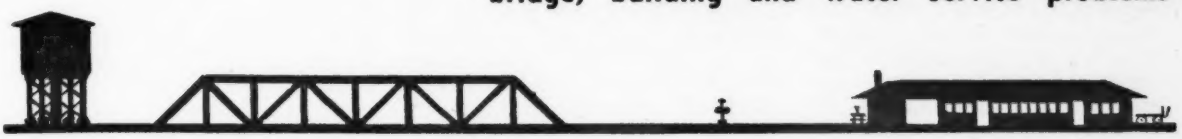


Cribbing made of old steel rails is used here to hold a fill on a steep slope on the Blue Ridge Loop of the Clinchfield. Two lengths of old rail were butt-welded together and driven to a depth of 78 ft. with a pile driver. Horizontal bracing (foreground) was then secured by driving lengths of rail beneath the roadbed at regular intervals

The problem of excessive heat loss, due to large window areas and the frequent opening of outer doors, has been solved through the installation of a radiant heating system in the Santa Fe's new station at Arkansas City, Kan. The system consists of wrought iron coils embedded in the concrete floor slab of the new structure

WHAT'S THE ANSWER?

An open forum for maintenance men on track, bridge, building and water service problems



Standard Color Schemes for Stations

What are the advantages and disadvantages of establishing standard colors and color schemes for painting passenger stations? Explain.

Permit Some Divergence

By L. E. PEYSER
Architect (Retired), Southern Pacific, San Francisco, Cal.

There are both advantages and disadvantages in establishing hard-and-fast color schemes for painting passenger stations. It is believed that a compromise between a standard and an intelligent divergence therefrom, under certain circumstances, will result in a desirable painting program.

On railroads where a standardized station design has been used to a considerable extent, it would appear logical that stations should be painted in standard colors. If the color is suitable at one location, it should be equally good at others.

The use of standard colors effects economies, since store stocks can be held to a minimum of these colors, rather than stocking a considerable number of various colors or mixing colors on the job. This last expedient is always a costly process and often leads to developing a poor, inappropriate or impermanent material. There is also an advertising value in such a program, in that the public is inclined to identify the color with the railroad using it.

Further economies result in maintenance when minor repairs require a touch-up painting job. Under such conditions it is possible to paint with good results the affected areas and no others using standard colors. Where non-standard colors are used it is quite difficult to match the previous paint.

Too much emphasis, however, cannot be given to the selection of standards to assure that they will be pleasing and suitable in color and in formulation for the areas in which they are to be used. It is desirable that the colors have individuality different from those used by paralleling railroads.

Any standard scheme should be as simple as possible, consisting of two, or at most three colors. This will assure that any average paint gang will not make errors in judgment as to which colors are to be applied to various surfaces. Such simplification is also in line with modern trends.

The foregoing does not apply to buildings of other than standard design. In such case, standard colors might be quite inappropriate, and alternative colors should be selected that are suitable for each particular type of architecture and that also fit each location. The relative importance of the building might have some effect on selecting colors either to emphasize the building or to make it harmonize with its surroundings.

In interior painting, standardization might well be carried further than for exteriors. In office spaces, a well-chosen color that is restful to the eyes could be used with equally good results in all buildings. This also applies to serviceable colors for use in baggage rooms, toilet rooms, etc.

The only areas in non-standard stations where divergence from standard colors might be desirable is in waiting rooms or other similar important public spaces where, for reasons of architecture or decorative design, appropriate non-standard colors would be indicated.

That there may be no change in

Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, *Railway Engineering and Maintenance*, 79 W. Monroe St., Chicago 3, and reach him at least 30 days in advance of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To be Answered In the February Issue

1. To what extent, if any, are shims suitable for prolonging the life of rail anchors? Are there disadvantages in their use? Explain.

2. What basic characteristics should a waterproofing material for masonry structures possess for railway use? Explain.

3. Where should switch-point locks be used on main-track switches? Why? At what points, if any, is their use objectionable? Explain.

4. To what extent, if any, does vibration reduce the air content of air entrained concrete? Explain.

5. What is the best method of installing tie plates out-of-face when adzing machines are used? How many men are necessary for each operation involved, and how should they be distributed? Explain.

6. What are the advantages and disadvantages of using distilled water in diesel locomotives? How does its use compare in effectiveness and economy with usual methods of water treatment? Explain.

standard colors over the years, master samples should be prepared in the form of large-sized color chips that can be supplied paint manufacturers, painter foremen, and others interested. Wet samples are not satisfactory, because of changes that occur in drying.

In any scheme of color standardization, the application should not be hard-and-fast, but rather some degree of divergence should be permitted, upon proper authorization, to provide for unusual conditions of climate, location, or possibly civic considerations. Such variations, however, should be considered, individually, lest the value of the standard program be lost.

Disadvantages Are Minor

By S. E. Kvenberg
Assistant Engineer, Chicago, Milwaukee, St. Paul & Pacific, Chicago

Several disadvantages of a standard color scheme for station buildings come to mind. One is the monotony of repetition. Another is the fact that occasionally it does not harmonize with a particular type of architecture or with the surroundings. In these two instances, an approved deviation from the standard can be worked out and this deviation can be considered standard on subsequent paintings, if desired.

The advantages of standardization, in my opinion, are many. For instance, a standard color scheme is distinctive and, after being used for a period of time, readily identifies the railroad. It is practical, in that before deciding on a combination of colors strictly from a standpoint of good looks, full consideration will probably be given to manufacturing costs, to the ability of the paint to cover dirty surfaces and to present a reasonably good appearance for a number of years, under severe conditions.

A standard color scheme is economical in that it reduces to the minimum the number of colors carried in stock and permits the stores department to maintain an adequate operating stock with reasonable inventory investment. It has the advantage of permitting the purchasing department to order large quantities from manufacturers early in the year, scheduling delivery of specified amounts throughout the working season. This, in turn, permits the manufacturer to plan for economical production which should be reflected in his price to the buyer.

Where standard colors are not used, building-repair crews must either carry a large supply of various colored paints or make an attempt to mix the desired colors at the site of remodeling or repair work.

From the standpoint of general supervision, a standard color scheme eliminates, to a large extent, the dissatisfaction others may have with someone's personal choice and the trouble experienced in attempting to work out in each individual instance a scheme that will be satisfactory to all concerned.

Standard Colors Best

By A. H. Simon
Engineer of Buildings, Chicago, Burlington & Quincy, Chicago

In my opinion it is important that standard colors be adopted for railway buildings, first because the buildings would then have a uniform color over the entire system and would give a nicer appearance to customers who would be riding over the line. Another reason for adopting a standard color scheme is the fact that it would be simpler for the storekeeper to handle the paint in fewer parcels.

Standard colors make office work easier by simplifying the ordering of paint. I also think that a better price can be obtained in many cases from the manufacturers because of being able to purchase a few colors in larger quantities. Lastly, standardization generally provides better efficiency.

Methods of Bonding Frogs

What is the simplest, the most convenient and most effective method of bonding rigid frogs so they will carry signal current? Spring frogs? Explain.

Many Ways Have Been Tried

By Signaling Apprentice

Rust and scale between the fishing surfaces of the rail and angle bars in a rail joint develop resistance to the flow of track-circuit current. To prevent failures of track circuits due to such high resistance in rail joints, bond connections are placed between the rail ends.

Rust and scale between the several sections of frogs can also increase the resistance to the flow of track-circuit current. Therefore, the non-homogeneous portions of frogs must be bonded together the same as the heels and toes are connected to the running rails. However, in many cases, the bonding method cannot be as simple as the bonding of rail joints.

Methods of bonding frogs have changed over the years either because of alterations in the design of the frogs or as a result of unsatisfactory performance of prior methods. When solid manganese frogs were in vogue and running rails were connected directly to the casting, two general bonding methods were employed. The first consisted of a long single bond wire connected to the ends of the running rails each side of the frog. The bond wire was laid on the switch ties to which it was securely stapled. Later, this single-wire bond was replaced with a double-strand bond wire fastened in the same manner.

This system was effective in carrying the track circuit around the frog, but provided no protection in those few cases where the manganese casting broke in two. For this and other reasons, bond plug inserts of iron or soft steel were cast in the vertical walls of some manganese frogs, including self-guarded frogs. These soft plugs permitted the drilling of bond holes and the use of short bond wires between the ends of running rails and each end of the frog.

Instead of a long bond wire stapled to the ties, one railroad at one time used a ¾-in. galvanized pipe with a bronze adaptor screwed to each end. To each adaptor was coupled a two-strand short bond which was fastened at the opposite end to the running rail in the usual manner. When installed, the threaded connections were clean and bright, were coated with a rust preventive and were drawn up as tight as possible. This type of bond functioned well where the track

was well maintained and vibration was at the minimum. However, where line and surface was poor enough to cause considerable vibration, or excessive movement between the frog and ties, the bond wires crystallized near the adaptors and failed.

When the solid manganese frog was superseded by the rail-bound manganese frog, bonding methods likewise changed. With this type of frog, the long bond was eliminated and shorter bond wires were connected between one of the wing rails and the main running rail at both the heel and toe of the frog. This bond was either fastened in drilled holes or welded to the wing rail. If the drilling method is used, the heel fillers are slotted at the flare end to provide for the drilling of the bond holes. At present it is also the practice to tie the main track running rails to the side track or turnout rails by bond wires looped under the base of the rails at heel and toe—usually using a bond on each side of the tie. These bonds are stapled to the ties involved with enough slack to permit at least some movement between tie and rail.

These same methods are used for the bonding of spring frogs except that more cross bonding between frog parts is necessary to eliminate the necessity of applying a bond wire to the heel end of the "jumping-jack" spring wing rail. Generally a cross bond is looped under the toe, coupling the end of the spring wing rail to the rigid wing rail. Another bond is looped under the frog at the flare end, coupling the rigid wing rail to the long point rail. Ordinary bonds are then applied around the heel and toe joints. Some roads vary this method somewhat but, in general, all schemes accomplish similar results.

Because of the greater vibration occurring at frogs the bond wires at such locations merit greater attention both at installation and during their entire life than do joint bonds. If given adequate attention at such times, failures will seldom occur.

Effect of Diesels on Weight of Rail

To what extent, if any, might complete dieselization alter the economics of the use of heavy rail? Explain.

Type of Power Unimportant

By G. M. Magee
Research Engineer, Association of American Railroads, Engineering Division, Central Research Laboratory, Chicago

In my opinion complete dieselization will not alter the economics of the use of heavy rail. The heavy rail being generally used today has been adopted because of the economic advantages involved and not because of strength requirements. It is true that flexural stresses in the rail and localized stresses in the upper-web and fillet areas are less with diesel power than with heavy steam power. This has been shown to be true by extensive stress measurements which we have conducted. However, 100-lb. rail has sufficient flexural strength when supported on good ties, ballast and roadbed to carry without undue damage any of the heaviest steam locomotives in use. Therefore, there is no logical reason for reducing rail size with diesel power because of flexural or web stresses within the rail.

Economic considerations which have justified the increase in rail size in recent years involve factors which can be grouped under five headings: (1) Rail life; (2) tie life (3) track labor; (4) equipment maintenance; and (5) fuel savings. As to the first factor, rail life, experience has shown that: (1) The heavy rail sections have a capacity for carrying more rail tonnage; and (2) this capacity increases more than an amount proportionate to the increase in rail weight. Likewise, heavier rail aids in reducing tie wear because it reduces: (1) The wave action and motion to which the tie is subjected through the rail's greater stiffness; and (2) the intensity of tie-plate pressure by distributing the wheel load over more ties.

Heavy rail also reduces the amount of track labor required for maintenance because its greater stiffness gives it the ability to bridge over irregularities in the track. Consequently, a less precise standard of maintenance tamping is required to provide good riding track. Track irregularities thus tend to develop less frequently and less rapidly with the heavier rail.

It has never yet been possible to evaluate benefits on the maintenance of equipment resulting from the use of heavy rail, but it seems certain that substantial economies do result. This is well illustrated by the cost of operation and maintenance of automobiles over bumpy gravel roads compared with smooth concrete pavements. Similarly, there is every reason to expect there will be less wear and breakage of parts on equipment when operated on smooth track with heavy rail as compared with track laid with light rail having more track irregularities.

Finally, tests have shown that slightly less fuel is required to operate trains on heavy rail than on light rail. With diesel power this saving would be substantially reduced because of its greater thermal efficiency. However, fuel savings are a comparatively minor factor in the justification for heavy rail and would not appreciably affect the economic picture.

In all of the above economic factors, the effect of locomotives, whether steam or diesel, is minor relative to the effect of the much larger tonnage involved in freight and passenger cars. The life of rails and ties, track and equipment maintenance costs, and fuel costs are determined more by gross tons of traffic carried than by the characteristics or the weight of the locomotives used. In my opinion, the use of heavy rail should continue with relation to traffic density carried irrespective of whether power is steam or diesel.

Intensive Study Needed

By Ray McBrian
Engineer Standards & Research, Denver & Rio Grande Western, Denver, Colo.

My personal views are that complete dieselization for some railroads can alter the economies in the use of heavy rail. Probably considerable study and actual service usage will be required for a particular road to determine the extent to which they can go in the economics of reduced rail sections.

On the other hand, high speed and high-traffic-density roads may well find that the continued use of the heavier rail sections is fully justified. But there are roads who

may also learn that complete dieselization warrants full study into the economics of rail usage. Actual stress measurements fully confirm that diesel operation results in much less stressing of the rail. There are some who express the view that the need for heavier rail sections now used depended in a large measure on the stresses developed by steam locomotives. With the elimination of steam locomotives and reduced service stresses in the rail, there are definite possibilities for savings. This is such an important subject that studies should be made to determine and explore fully all possibilities.

Is Heavy Rail Necessary?

By Lee Spencer
Track Supervisor (Retired), Long Island, Phoenix, Ariz.

As a practical trackman having had under my supervision a heavy-traffic territory using both light and heavy rail sections, I have found that most engineers tended to credit our heavy-rail locations with savings which rightfully would not stand up under unbiased investigation. Our use of heavy rail, as on most roads, was brought about by the constant increase in the size, wheel loads and speeds of steam power and the damage caused to our light rail by the reciprocating parts of this type of power. Under this threat there probably was no other alternative. But under 100-per cent dieselization I think this specific threat is eliminated. Can it not then be translated into economies?

Some engineer-analysts, in arriving at specific savings resulting from the use of heavy rail instead of lighter rail, always seemed to me to be adding oranges and apples together and getting lemons (savings) for an answer. I think this because heavy rail was given for the savings. In my opinion, there was as much difference in these seemingly related conditions as there is between day and night. Without exception, and rightfully so, the new heavy rail was laid on tie plates sometimes having twice the bearing area of those under the lighter rail. In general, these plates were of the double-shoulder type. After the rail was laid the track was reworked and heavily retied. Anchor-spiking, which was adopted as standard at that time, held the large plates firmly to the tie. Double and even triple the number of rail anchors were also applied to the heavy rail as previously used. The rail was joined by six-hole joint bars instead of four-hole bars. Drainage was greatly improved, and finally the rebuilt track was given a high surfacing lift on new ballast, then mechanically tamped uniformly. Even the ballast was better than that previously used. After all this was done, the resulting savings in man-hours and expense was credited almost entirely to the heavy rail used. Was this strictly true?

Wellington stated the case very simply many years ago, saying railroads should not buy pounds of steel, but rather they should buy stiffness in the track structure. We all know new heavy rail has more stiffness than the old lighter section it replaced, but does it have as much as we think? Dr. Talbot's experiments on track stiffness conducted carefully for the A.R.E.A. proved that, under equal conditions of load and support, the overall difference in stiffness between the heaviest rail (152 lb.) he used and rail as light as 90-lb. was small. Cannot these findings be translated into economies in track maintenance?

After talking to Dr. Talbot in the late 1930's I tried out some of his findings, supporting my 90-lb. and 100-lb. rail on 14-in. tie plates designed for 115-lb. and 131-lb. rail. I fully anchor-spiked and otherwise treated the old rail exactly as if the heavier section of rail had also been used. Such track today seems to ride as well and be as economical to maintain as adjoining trackage laid with heavier sections of rail. Does this not indicate that light rail can serve adequately—especially if it is aided by the elimination of the steam locomotive and its damaging reciprocating parts?

Who Should Repair M. of W. Equipment?

Should roadway machines and M/W work equipment be repaired in shops under the jurisdiction of the mechanical or maintenance-of-way departments? Why?

Make Repairs in M/W Shops

By R. K. Johnson*
Superintendent of Work Equipment & Reclamation, Chesapeake & Ohio, Barboursville, W. Va.

There is ample precedent for the view that roadway machines and work equipment should be repaired in shops under the jurisdiction of the maintenance-of-way department. The American Railway Engineering Association is on record as favoring this practice as evidenced by the following statements which appear on pages 27-9 and 27-10 of its Manual of recommended practice under the heading of "Care and Operation of Maintenance of Way Work Equipment":

"This superintendent of work equipment should have authority, and sufficient personnel, to institute and enforce regulations for the maintenance and operation of the equipment. His duties should embrace direct control of all mechanical details of the equipment, in both field and shop, the supervision of all maintainers, and the making of all reports.

"Shops for the repair of roadway work equipment should be centrally located and entirely under the control of the maintenance-of-way department."

The A.R.E.A. further records preference for jurisdiction by the maintenance-of-way department in a report published in Volume 47 of its Proceedings, on page 182, under the subject, "Organization, Machinery, and Tools for Repairing Maintenance of Way Work Equipment" which, in part, reads as follows:

"Repairs to the machines that are beyond the ability of the maintainer in the field can be more economically handled in a shop or shops especially equipped to repair maintenance-of-way work equipment. Special tools and machinery are needed to completely overhaul such equipment—the majority being similar to tools and machinery used in garages or repair shops operated by bus and trucking companies, or others specializing in the repair of gasoline and diesel-engine operated equipment. Skilled mechanics of various crafts, trained in the repair of this type of equipment, are necessary.

* Chairman, A.R.E.A. Committee 27 Maintenance of Way Work Equipment.

"Ordinarily the maintenance-of-equipment shops on railroads are equipped only to service locomotives and cars and do not have the special machinery and tools required for work on roadway appliances. By the same token, the mechanics employed in the maintenance-of-equipment shop are trained to service locomotives and cars and are not trained to repair maintenance-of-way work equipment. Usually when maintenance-of-way work equipment is handled in the mechanical department shops, such work is considered secondary to the handling of equipment for which that department is directly responsible. This entails delay in repairs to maintenance-of-way department work equipment."

Excerpts from an address before a convention of the American Railway Engineering Association, by a prominent engineering officer, and published on pages 828-831 of Volume 51 of the A.R.E.A. Proceedings, read as follows:

"Shop supervisors should be furnished with a shop or shops fully equipped with necessary tools and machinery and properly manned so as to make complete repairs to work equipment.

"Special machines and tools are needed to completely overhaul maintenance-of-way work equipment. Skilled mechanics, trained in the maintenance of this equipment, are necessary."

M/W Men Do Job Best

By C. A. Norden
Assistant Engineer, Western Pacific, San Francisco, Cal.

The handling of repairs to maintenance-of-way equipment, such as that included in the normal I.C.C. Account-37 classification, is purely a maintenance-of-way responsibility for many reasons.

Repairs to this class of work must be programmed so that all equipment needed for the coming year's work is in first-class condition so that there can be no delay in the work schedule. This can only be accomplished by a craft organized for this purpose, familiar with the equipment and working in a shop tooled for the kind of work involved.

With a special organization for this kind of work, the equipment is not subject to deferment in favor of the mechanical department, which is primarily more concerned with heavier maintenance-of-equipment on locomotives and cars.

The cost of making repairs favors the maintenance-of-way shop, largely because of the shop-expense factor tacked on to all work done by the mechanical department. The principal reasons, however, bear repetition: (1) In an M/W shop, you have a crew of experts experienced with the machines and the work those machines are required to do; (2) these experts have the necessary parts at hand in most cases and therefore can so program their repair schedule as to have all machines ready when needed. I think this is the most important reason.

We Need Our Own Shops

By Section Foreman

From a maintenance-of-way man's standpoint I would say to have all our equipment repaired under the jurisdiction of the maintenance-of-way department. Our department is today quite largely mechanized, and we depend on our work equipment a great deal because it has become a necessity.

We, as the operators of the various machines, get to know the small technical points which get the most out of these machines, and those which cause total breakdowns. These breakdowns frequently occur after our machines are shipped into the mechanical department for repairs, but are returned half repaired, because the mechanics who worked on them were never trained to do this kind of work and have no knowledge of the working principles of the machines. Most of the time they improvise with some misfit and sometimes homemade parts.

Mechanical departments are more or less set up for repairing the rolling stock of the railroad. In recent years this department has become divided into many different subdepartments each individually having jurisdiction over a certain class of work. For instance, the car department, the electrical department, the locomotive-diesel departments, and many others, have been established to give each more specialists in its own craft.

This logically suggested a good reason for keeping the jurisdiction over the repairs of M/W machines in the M/W department. It takes special tools and equipment to make the proper repairs. We know the essential parts which usually wear out or break most frequently, consequently we are better able to choose the size of our inventory and the specific part included. This reduces the waiting period which we all know is very expensive at times when parts are needed.

Because of these facts, why shouldn't we supervise our own shops to take care of the machines that make our work so much easier for us?

Hard to Schedule Repairs

By George S. Crites
Division Engineer (Retired), Baltimore & Ohio, Baltimore, Md.

The railway mechanical departments are well equipped with shops, machines and tools to undertake repairs to work equipment such as steam shovels, pile drivers, ditchers, dump cars, snow plows, graders, etc., but generally such departments can not economically undertake running repairs, or at times, general repairs, to machines such as motor cars, tie tampers, automobile trucks, ballast cleaners and the multitude of other roadway machines and work equipment now in use in the construction and repair of tracks and structures.

In as much as this latter equipment has to be in serviceable condition at all times, it is essential that competent mechanics with proper tools be provided to keep them in running order. This service can best be provided by the supervision and personnel of the M/W department.

During the off seasons for such machines and equipment, the personnel that inspects and repairs them on the job should be provided with proper housing, tools and equipment to put the machines and equipment in prime condition for the next working season. By handling the important matter of upkeep and repairs of equipment in this way, a more satisfied, competent and more permanent organization of inspectors and mechanics can be held in the M/W departments.

Several problems will be encountered in handling repairs in this manner and the worst one may be that of budgeting the work. When railway earnings are poor, M/W budgets are cut by necessity. Money for the repair of machines and equipment may almost disap-

pear. If it is thoroughly understood that roadway machines and M/W work equipment are money savers, it should be possible to budget their repairs and upkeep during both good and bad times.

It is not all to the good in concentrating roadway machine and work equipment repairs under the mechanical departments. The proper scheduling of repairs becomes the worst problem. When repairs to revenue rolling stock create pressing and urgent needs, little or nothing can be done towards repairing non-revenue equipment. On the other hand, when repairs to revenue rolling stock are slack, there is a tendency to schedule repairs to M/W machines with the result that forces not entirely familiar with such work may do an unsatisfactory and uneconomical job on it. Here again, it is not thoroughly understood that roadway machines and M/W work equipment are purchased by the management as money savers and their repairs are needed to save money and not to waste it.

Repairing Concrete Ballast Deck Bridges

When a single-track concrete ballast-deck bridge begins to deteriorate badly, how can repairs be made effectively under traffic?

Chip Concrete, Paint Steel

By J. F. Marsh
Engineer of Bridges, Chicago, Rock Island & Pacific, Chicago

Recent tests made by the research department of the Association of American Railroads with electric strain gauges on a concrete slab bridge in this vicinity indicate that the stresses are very low at the bottom of the slab, both in the concrete and in the reinforcing bars. This is explained by the fact that the concrete takes some tension and the distribution is better than it is usually calculated to be.

With this information at hand, it would be satisfactory to chip the deteriorated concrete at the underside of concrete-slab bridges and paint the underside including the steel reinforcement with an asphaltum product. If the concrete pile bents are deteriorated, they may be ringed with reinforcement and encased below the concrete cap to a point just below the ground line. In such instances, pile pressures should be checked for the increased weight of concrete.

Replace with Treated Wood

By Assistant Bridge Engineer

The problem of adequately repairing a concrete ballast-deck bridge that has begun to deteriorate is not as simple as it would seem to be. On small jobs we have attempted to patch the concrete, but in most cases have had to classify the results as somewhat less than satisfactory.

Our inability to obtain the perfect work we desired on these jobs has led us to the conclusion that the best way to repair badly deteriorated structures is to replace them. We have one such structure in the planning stage at the present time.

In this particular case we are going to replace the concrete ballast deck with a solid creosoted-timber ballast deck, doing the work in small sections. Our present plans, which may be altered before final decisions are made, call for portions of the track to be supported on temporary stringers, probably of the rail type, and the old concrete removed and replaced by a creosoted timber deck. We don't expect the work to be easy but we believe we will get an economical and satisfactory result.

Uses for Plastic Pipe on Railways

Under what conditions, if any, can plastic pipe be used by railways for water lines? For fuel oil lines? What are the advantages and disadvantages in such use? Explain.

Plastic Pipe Non-Corrosive

By Russell M. Schad
Carlon Products Corporation, Cleveland, Ohio

Plastic pipe can be used on railways for any service in which its characteristics are desirable. From the following brief description of those characteristics, its possible uses can easily be determined.

We furnish two general types of pipe made of plastic material. One is especially suitable for water service. It is produced from a polyethylene plastic in nominal IPS pipe sizes of ⅛ in. through 6 in. It is flexible and therefore can be supplied in long lengths made up in coils for convenient handling. The 4-in. and 6-in. sizes are somewhat rigid and are therefore supplied in 25-ft. straight lengths. The flexibility and excellent resiliency of this plastic pipe make it practically unbreakable. Its resiliency is maintained at low temperatures and the pipe is unaffected by freezing water. Since it is a non-conductor, corrosion by electrolysis or a galvanic couple is impossible. Its extreme resistance to acids and alkalies prevents any chemical action from soil or water. Thus, collection of sediment or deposits is not a hazard and its self-rinsing qualities maintain maximum flow at all times.

This pipe is described generally as a thermal-plastic material. As such it is subject to changes by heat in that increased temperatures will progressively decrease its tensile strength and affect its chemical resistance. Therefore, its major limitations are considered to be temperature and high working pressures. Also, caution should be used when working with chlorinated hydrocarbons, some of the parent hydrocarbons, a few esters and certain oils. It is therefore not recommended for use in handling gasoline and fuel oils.

The installation of plastic pipe is simple and rapid because of its flexibility and light weight. It will follow the contour of the ground or can be snaked around obstacles. Plastic fittings are available for making all types of common connections to other plastic lines or to previously installed metallic pipes.

To handle gasoline and fuel oil we recommend our second type of pipe. This is a rigid plastic mate-

(*Continued on page* 1106)

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FOR 1953

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rial supplied in 10 or 20-ft. sections. It will not rot, rust or corrode and retains excellent chemical resistance. The most singular advantage over other plastics is its high tensile strength. This type of pipe is designed for services requiring a corrosion-proof and chemically resistant, rigid pipe.

The characteristic of plastic pipe to expand and contract from changes in temperature creates longitudinal stresses and is the major condition requiring caution in its installation. In normal cold-water lines the longitudinal stress can be greatly alleviated by running cold water through the lines before backfilling the ditch. A compression coupling has been designed to compensate for longitudinal stresses in lines of moderate pressure. This coupling is usually installed in long lines at intervals of 50 or 60 ft. Lines known to have wide temperature variations will use compression couplings approximately every 20 ft. The final mounting or the final backfilling of a line should be done with the pipe line operating at its lowest temperature.

Plastic Pipe in Use

By George S. Crites
Division Engineer (Retired), Baltimore & Ohio, Baltimore, Md.

Plastic pipes and tubes of certain types have long been in use on railways for carrying water and fuel oils. Of the thousands or more modern, synthetic plastics that are now being produced, most are still expensive. For unusual needs, a tube or pipe which is molded or extruded from a plastic that is best suited for the purpose could be used.

A plastic has recently been perfected which may be in quantity production soon. This plastic is resistant to acid and oil, is shock proof, is not subject to electrolysis, does not expand or contract with changes in temperature and can be threaded and machined the same as steel. Pipes or tubes made from such a plastic could well serve indefinitely for carrying any kind of water or oil. At its present high cost, however, its use can be justified only by its availability during shortages of other cheaper piping materials.

PRODUCTS OF MANUFACTURERS

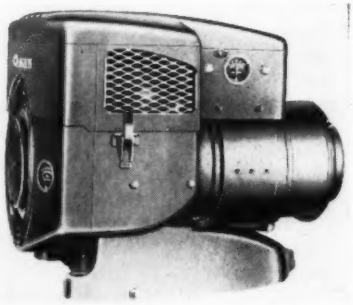
New, improved equipment, materials, devices

(For information on any of the products described in these columns, use postcards, page 1072)

TRACTOR EMBODIES MANY NEW FEATURES

THE Oliver Corporation, Cleveland, Ohio, has announced that its new "OC-18" crawler tractor is now available. According to the manufacturer, this new tractor has many new features which make it unusually easy to operate. Air steering is standard equipment on this tractor, as is an over-center clutch which runs across the entire width of the dashboard so that the operator can easily locate it without taking his eyes off the job. Other features include pushbutton electric starting with a cold weather starting aid as standard equipment, center positioned gear shift lever, parking brakes, throttle located at right arm rest, ample leg room, and comfortable two-man upholstered seat. The tracks have been designed for maximum ground contact to give the tractor the greatest possible pulling power and more stability and balance for dozing. The OC-18 has 126 rated horsepower and, it is said, can be operated in mud, rocks or stumps because of unusually high clearance.

NEW 3,500-WATT A. C. ELECTRIC PLANT



A NEW 3,500-watt, alternating-current electric generator has been announced by D. W. Onan & Sons, Inc., Minneapolis, Minn. Conservatively rated, it is said to have a 4,000-watt peak overload capacity for periods of up to two hours operation. The Model 305CK has been designed to meet the demand for high capacity in small-sized electric plants. The 115-volt, 60-cycle unit is powered by the Onan "CK," two-cylinder, 4-cycle, air-cooled gasoline engine. The manufacturer claims that a patented engine improvement gives this model an increased rated output of 500 watts over similar Onan "CK"-powered models. With a voltage regulation of plus or minus 3 per cent, it is said that the 305CK will satisfy the requirements of virtually any application where regulation is a vital factor. The Model 305CK is available in either manual or remote starting models. Manual plants are equipped with the Onan Readi-Pull starter and are said to start easily and quickly through high-tension magneto ignition. Remote starting units are electrically cranked with the generator acting as the cranking motor. Fully automatic and line transfer controls are available for

(*Continued on page* 1108)

Look at the many advantages multi-purpose Macbeth Spike Anchors have over other types of rail fasteners!

REDUCES MECHANICAL WEAR:

4 Macbeth Spike Anchors clamp rails, tie and tie plates solidly together with a force of approximately 4½ tons. No hold down spikes or conventional wear-resistant devices required because *the tie plates can't shift.* Mechanical wear is reduced because there is no relative motion between the tie and tie plates.

REPLACES CONVENTIONAL SPIKE AND ANCHOR:

Macbeth Spike Anchors drive into the ties through the line spike holes of standard tie plates. *Every* Macbeth is immediately effective when fitted and *stays* that way. They hold the rail with a grip far exceeding the resistance of the ballast...and stop creep *both ways.*

NO MAINTENANCE:

Macbeth Spike Anchors when properly driven require no maintenance...because *they won't work loose.*

REDUCES IMMEDIATE AND LONG-RANGE COSTS:

4 Macbeth Spike Anchors per tie do the job of line spikes, hold downs and at least *2* conventional anchors (*4* when 2-way holding is needed)...and you don't need wear-resistant devices. Macbeths cut maintenance...and since they reduce wear, your tie renewal costs come down, too.

for facts, figures and comparative costs, write for Bulletin C.

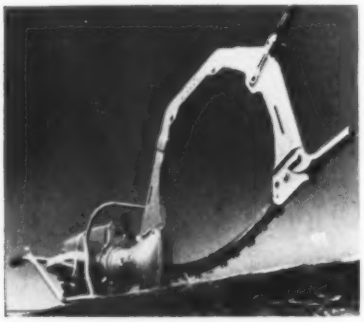
H. T. KENNEDY COMPANY, INC. • 37 WALL STREET • NEW YORK 5, N. Y.

For additional information on any of the products described on these pages, use postcards, page 1072.

remote starting units. For standby service, the line-transfer control is said to start the unit automatically, within seconds, after failure of the power source. When power is restored the plant is automatically stopped.

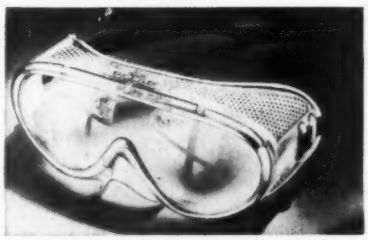
NEW CHAIN BOW SAW

A "FREE-FLOW" bow saw has recently been made available by Henry Disston & Sons, Inc., Philadelphia, Pa. The "free-flow" feature of the saw applies to the manner by which the saw chain is carried within the bow frame on four ball bearings, rather than around a continuous steel rail as in conventional power saws. The manufacturer claims that this design permits faster chain travel, reduces the possibility of stalling, and, since friction is reduced, reduces wear. The new unit, which features a 25-in. bite, is powered by a 9-hp. Mercury gasoline engine and, although primarily designed for two-man operation, can be handled by one man in close locations where the use of an ordinary saw would not be feasible. A rubber grip handle on the bow frame allows adjustment of one of the idler bearings to increase or decrease chain tension.



NEW PLASTIC SAFETY GOGGLE

A NEW plastic safety goggle, called Saf-I-Flex, has recently been developed by the United States Safety Service Company, Kansas City, Mo. It is claimed that, through new design and the use of newly developed and improved materials, wearing comfort, strength and durability are increased. A newly-designed frame of Vinyl plastic has rolled edges where it contacts the wearer's face and a new type grid ventilation is said to make the goggle unusually comfortable and entirely fog free.



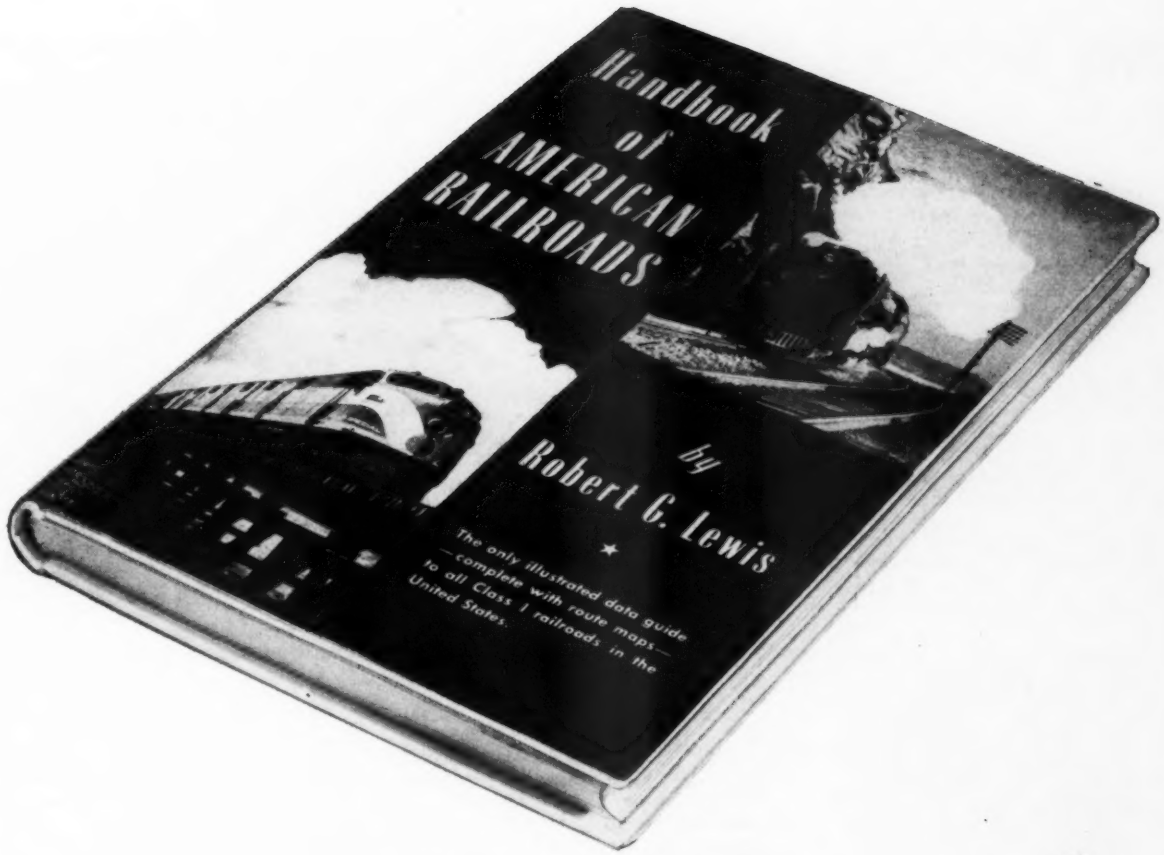
The clear plastic frame permits full side vision. The new style, optically correct lens can be quickly and easily changed and locks securely into the frame at seven different points. The goggle, which weighs 1.7 ounces, is said to exceed federal specifications for impact resistance and strength.

CRANES FEATURE FLUID TORQUE DRIVE

THE UNIT Crane & Shovel Corp., Milwaukee, Wis., has announced the application of fluid torque drive as a standard installation on their ½-yd. crawler and mobile machines. The installation is said to accomplish smoother load handling with greater work output without increasing fuel consumption. The installation still retains the method Unit has always applied of mounting the engine "straight-in-line" with the main machinery. The fact that it is connected to a worm-driven power take-off by means of a chain coupling eliminates the engine clutch and its lever system. The installation, which has been thoroughly field tested in all operations as a shovel trenchoe, clamshell, dragline, etc., consists of a 6-cylinder Industrial gasoline engine and Chrysler torque converter.

LIGHTWEIGHT CHAIN SAW

HOFFCO, Inc., Richmond, Ind., has announced the availability of a new chain saw called the "Sawette." The manufacturer claims that this new saw will cut trees and any other growth up to 6 in. in diameter —even under water. Design of the unit enables the operator to cut level with the ground while in an upright position, and the saw's light weight is said to allow a high degree of maneuverability with a minimum of physical effort. Features of the Sawette include a 2-hp. gasoline engine, concentric bowl float feed carburetor, 1-qt. fuel tank, 12-in. tempered spring steel blade bar, ½-in. pitch chisel tooth, and a 32-in saw chain. The unit weighs 26 lb., is painted highway yellow with red trim, and is interchangeable with Hoffco's "Scythette" portable scythe.



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RE & M 11-52

THE MONTH'S NEWS

Happenings among the railways — the associations — the suppliers

Changes in Railway Personnel

General

E. R. Moran, assistant superintendent of the Denver & Rio Grande Western at Grand Junction, Colo., and an engineer through training and experience, has been promoted to superintendent with the same headquarters. Mr. Moran's railroad career began in 1938 when he

E. R. Moran

joined the Denver & Salt Lake as a section laborer. He later transferred to the engineering department where he advanced to the position of assistant roadmaster. Since joining the Rio Grande in 1944 as roadmaster, Mr. Moran has held the positions of engineer of track and trainmaster, and, since September 1951, assistant division superintendent.

Engineering

R. E. Taylor, engineer of buildings for the Western region of the Canadian National, with headquarters at Winnipeg, Man., retired recently after 41 years of service.

D. C. Hastings, supervisor of safety on the Richmond, Fredericksburg & Potomac at Richmond, Va., has been promoted to division engineer at Richmond succeeding **J. A. Blalock**, deceased (RE&M, October, p. 1024).

A. M. Schofield, formerly supervisor of track on the Pennsylvania at Philadelphia, Pa., who has returned from military service, has been appointed assistant division engineer on the Susquehanna division.

D. E. Pergrin, supervisor of track on the Middle division of the Pennsylvania at Altoona, Pa., has been promoted to assistant division engineer of the Columbus division at Columbus, Ohio, succeeding **H. P. Morgan.**

E. L. Hoffman, roadmaster on the Chicago & North Western at Mason City, Iowa, has been promoted to division engineer of the Nebraska division at Norfolk, Neb. He succeeds **A. A. Colvin**, who has retired after 40 years of service.

R. A. Ullery, chief draftsman on the Bessemer & Lake Erie, has been appointed assistant to chief engineer at Greenville, Pa. The position of principal assistant engineer, held by **Lawrence Spalding**, deceased, has been discontinued.

Dwight E. Perrine, office engineer for the Chicago & Western Indiana and the Belt Railway Company of Chicago, has been promoted to assistant chief engineer with headquarters, as before, at Chicago. Mr. Perrine is succeeded by **J. E. Peterson.**

J. J. Richardson, supervisory engineer of the construction of the new express extension of the Canadian Pacific at Windsor station, Montreal, Que., has been appointed district engineer at St. John, N. B., to succeed **J. A. Mackenzie**, who has retired after more than 30 years of service.

Samuel R. Low, Sr., transitman in the engineering department of the Norfolk & Western, who served as resident engineer at Winston-Salem, N. C., from 1947 to 1949 during the improvement of the engine terminal facilities there, has been re-appointed resident engineer with headquarters as before at Roanoke, Va.

R. K. DeLong, division engineer on the Moncton division of the Canadian National, has been appointed engineer of construction, with headquarters as before at Moncton, N. B., to succeed **R. J. Dustan**, terminal engineer, who has retired. **B. F. Keays**, division engineer at New Glasgow, N. S., has been transferred to Moncton to replace Mr. DeLong. **R. F. Mackenzie**, assistant division engineer at Campbellton, N. B., has been advanced to division engineer to succeed Mr. Keays, and **D. A. Slack**, instrumentman at Edmundston, N. B., has been advanced to assistant division engineer to replace Mr. MacKenize.

J. C. Williams, assistant engineer of buildings for the Seaboard Air Line, has been promoted to engineer of buildings with headquarters as before at Norfolk, Va., to succeed **W. L. Darden**, who has retired after more than 47 years of service. **T. S. Williams**, chief draftsman, has been appointed assistant engineer of buildings to replace J. C. Williams. **A. E. Lewis**, structural engineer, has been appointed chief draftsman to succeed T. S. Williams, and **S. B. Holt**, sturctural engineer has replaced Mr. Lewis. **E. S. Laws**, structural designer, has been advanced to structural engineer to succeed Mr. Holt.

Mr. Darden was born in Green County, N. C., in 1882 and was graduated from North Carolina State College in civil engineering in 1905. Upon graduation he entered the service of the Seaboard as a draftsman at Portsmouth and was appointed chief draftsman in 1910, engineer of buildings in 1914, senior assistant engineer in 1926, and assistant chief engineer in 1941. In 1944 Mr. Darden again became engineer of buildings when the engineering and maintenance-of-way departments were consolidated.

T. S. Williams was graduated from North Carolina State College in civil engineering and began his career with the Seaboard in 1923. He became chief draftsman in 1943.

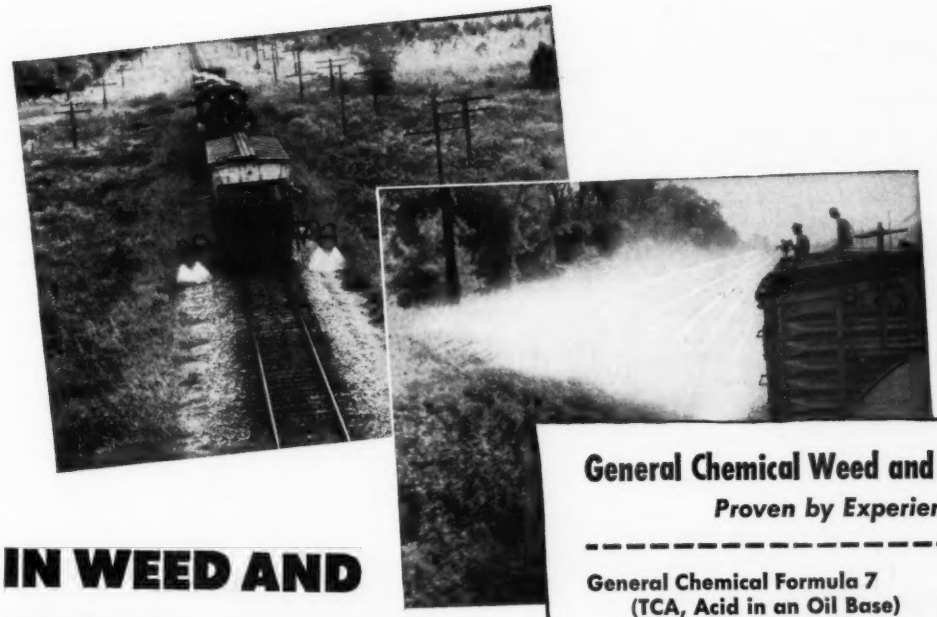
Mr. Lewis was born January 3, 1922, in Lorain, Ohio, and is a graduate of the University of Florida in civil engineering. He began service with the Seaboard on June 16, 1947, as a draftsman at Norfolk and was promoted to structural engineer on September 1, 1950.

Mr. Holt was born at Oglethorpe, Ga., on May 19, 1919, and is a graduate of Virginia Polytechnic Institute in civil engineering. He entered the service of the Seaboard at Norfolk on September 16, 1948, as a structural designer and was promoted to structural engineer on September 1, 1950.

Mr. Laws was born at Arran, Fla., on June 23, 1927, and is a graduate of the University of Florida in civil engineering. He started work with the Seaboard at Norfolk on March 19, 1951, as a structural designer.

James M. Curran, recently appointed bridge engineer on the Union Pacific at Omaha, Neb. (RE&M, Sept., p. 908), joined the UP in 1928 as a draftsman, advancing to bridge inspector in 1941. He was named assistant engineer in 1947 and, later that same year, was promoted to structural engineer, the position he

(*Continued on page* 1112)



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General Chemical Sodium TCA (Liquid Concentrate)
- For soil treatment of noxious grasses.
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- Low cost contact type weed killer for use where weed and grass control problems are not severe... contains pentachlorophenol.

General Chemical 2, 4-D Amine Additive
- Used in conjunction with General Chemical Formula 7 for all-purpose weed and grass control.

General Chemical 2, 4-D Ester Additive
- For use with General Chemical Formula 7 or Sodium TCA where cotton or other plants susceptible to 2, 4-D are not present.

General Chemical 2, 4-D—2, 4, 5-T Ester Brush Killer
(Water Soluble)

GENERAL CHEMICAL WEED CONTROL

held at the time of his recent promotion.

C. C. Herrick, assistant engineer on the New York Central at Cleveland, Ohio, has been appointed division engineer of the Ohio Central division at Columbus, Ohio, succeeding **J. D. Fraser,** who has been transferred to the Toledo division, with headquarters at Toledo, Ohio. Mr. Fraser replaces **C. R. Strattman,** who has been appointed special assistant engineer, office of district engineer, at Cleveland.

W. C. Richardson, roadmaster on the Canadian National at Dauphin, Man., has been promoted to division engineer at Regina, Sask., to succeed **C. D. Worby,** who has been promoted to engineer of track for the Western region with headquarters at Winnipeg, Man. **J. Conrad,** construction engineer on the Lynne Lake project in northern Manitoba, has been appointed district engineer of the British Columbia district with headquarters in Vancouver, B. C., to succeed **St. J. Munroe,** who has retired.

J. E. Gibault, who has been appointed terminal construction engineer of the Canadian National at Montreal, as announced recently (RE&M, September, p. 908), was born at St. Jerome, Terrebonne County, Que., and attended the University of Montreal (C. E., Mining Engineer and B.A.Sc. 1910). He entered railroad service in 1910 as engineer, constructing residences and terminals with the National Transcontinental (now CNR). He subsequently served the CNR as resident engineer, division engineer, engineer of the bureau of economics, and

J. E. Gibault

division superintendent. Mr. Gibault was appointed assistant general manager of the Atlantic region at Moncton, N. B., in August 1940 and in December 1942 he became chief of research at Montreal. He was serving in the latter capacity when he received his recent appointment.

C. R. Bergman, division engineer of the Lake division of the Pennsylvania at Cleveland, Ohio, has been appointed assistant chief engineer maintenance of way of the eastern region at Philadelphia. Mr. Bergman was born at Warren, Pa., and was graduated from Pennsylvania State College in 1928. While still a student in 1927 he entered the service of the PRR

C. R. Bergman

as an assistant on the engineer corps at Philadelphia and, after completing his education, he served in a similar capacity at New York. Mr. Bergman was appointed assistant supervisor of track in November 1928, supervisor of track in 1933, assistant division engineer of the Maryland division in 1943, division engineer of the Renovo division at Erie, Pa., in May 1944 and division engineer of the

(*Continued on page* 1114)

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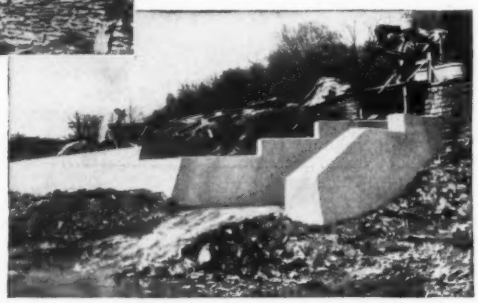
BEFORE AND AFTER



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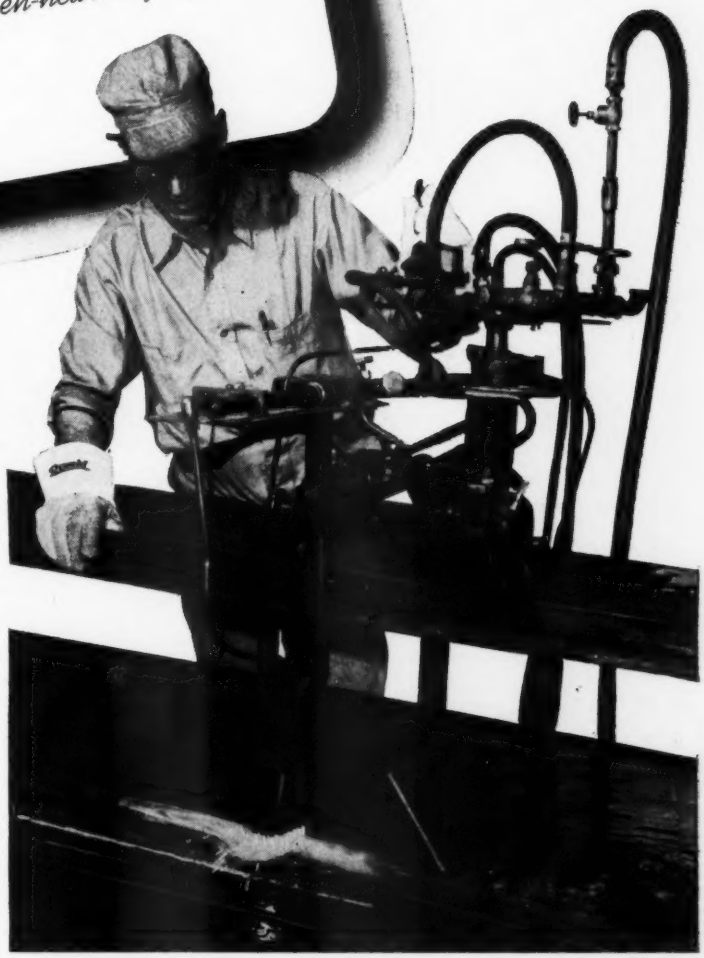
For additional information, use postcard, pages 1112A-1112B

Memorandum to:

ENGINEERING AND PURCHASING OFFICERS

Major savings in track maintenance costs are being made by many railroads that have flame-hardened open-hearth frogs and crossings.



Railroad after railroad follows OXWELD's procedures in constructing simple, efficient frog flame-hardening setups. Thousands of frogs that have been flame-hardened are now in track. These treated frogs are giving far longer service than unhardened frogs — five times longer service and more. This is impressive evidence of the value of OXWELD's flame-hardening process in reducing maintenance costs on frogs and crossings.

Ask your OXWELD representative for details or write for Booklet F 7007 which gives complete information.

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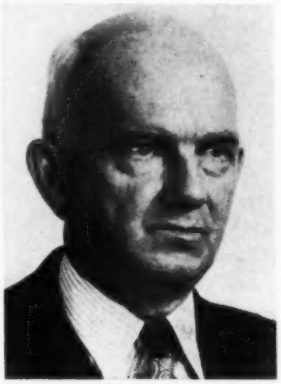
Factory and General Offices: Eau Claire, Wisconsin, U. S. A.

Railway Personnel (Cont'd)

Chicago Terminal division at Chicago in December 1944. He was named engineer maintenance of way of the Western Pennsylvania division at Pittsburgh in June 1947, and two years later was appointed division engineer of the newly-formed Lake division at Cleveland.

G. R. Doull, principal assistant engineer for the Atlantic region of the Canadian National, has been promoted to



George R. Doull

assistant chief engineer, with headquarters as before at Moncton, N. B. **R. P. Puddester,** district engineer at St. John's, N. F. has been advanced to principal assistant engineer at Moncton to succeed Mr. Doull, and **A. R. Penney,** assistant district engineer at St. John's, has been promoted to division engineer to succeed Mr. Puddester. The position of district engineer has been abolished.

Mr. Doull was born at New Glasgow, N. S., on January 26, 1892. Following service with the Maritime Bridge Company at that location, he joined the service of the Canadian Government Railways (now CNR) on August 28, 1914, as a tracer on the construction of the Halifax Ocean Terminals. In August 1916, Mr. Doull was promoted to draftsman, and in November of the same year was transferred to Moncton, from which point he moved to Toronto, Ont., in May 1921 as an assistant engineer. In July 1943 Mr. Doull returned to the engineering department at Moncton and the following year was named bridge engineer of the Atlantic region. In 1950 he was promoted to principal assistant engineer for that region.

Charles E. Sloan, engineer of bridges for the Baltimore & Ohio, has been appointed engineer of bridges and buildings with headquarters as before at Baltimore, Md. In this capacity Mr. Sloan will take over the duties of **Leland P. Kimball,** engineer of buildings, who has retired. **Otis G. Wilbur,** assistant engineer of buildings, and **Abram Clark,** designing engineer in the bridge department, have been appointed assistant engineers of bridges and buildings, and **Gurney H. Dayett, Sr.,** assistant engineer of bridges, has been appointed assistant to the engineer of bridges and buildings.

For additional information, use postcard, pages 1112A-1112B

Mr. Sloan was born at Lewisville, Ohio, on February 7, 1885, and entered the engineering department of the B&O in 1913, advancing to chief bridge draftsman on August 1, 1918, and to assistant engineer of bridges on March 1, 1923. He received a degree of Bachelor of Science in civil engineering from West Virginia University in 1933; a Bachelor of Science degree from Johns Hopkins University in 1937; and a degree in civil engineering (professional) from West Virginia Uni-

Charles E. Sloan

versity in 1938. In 1940 Mr. Sloan was named engineer of bridges for the B&O, the position he held until his recent promotion.

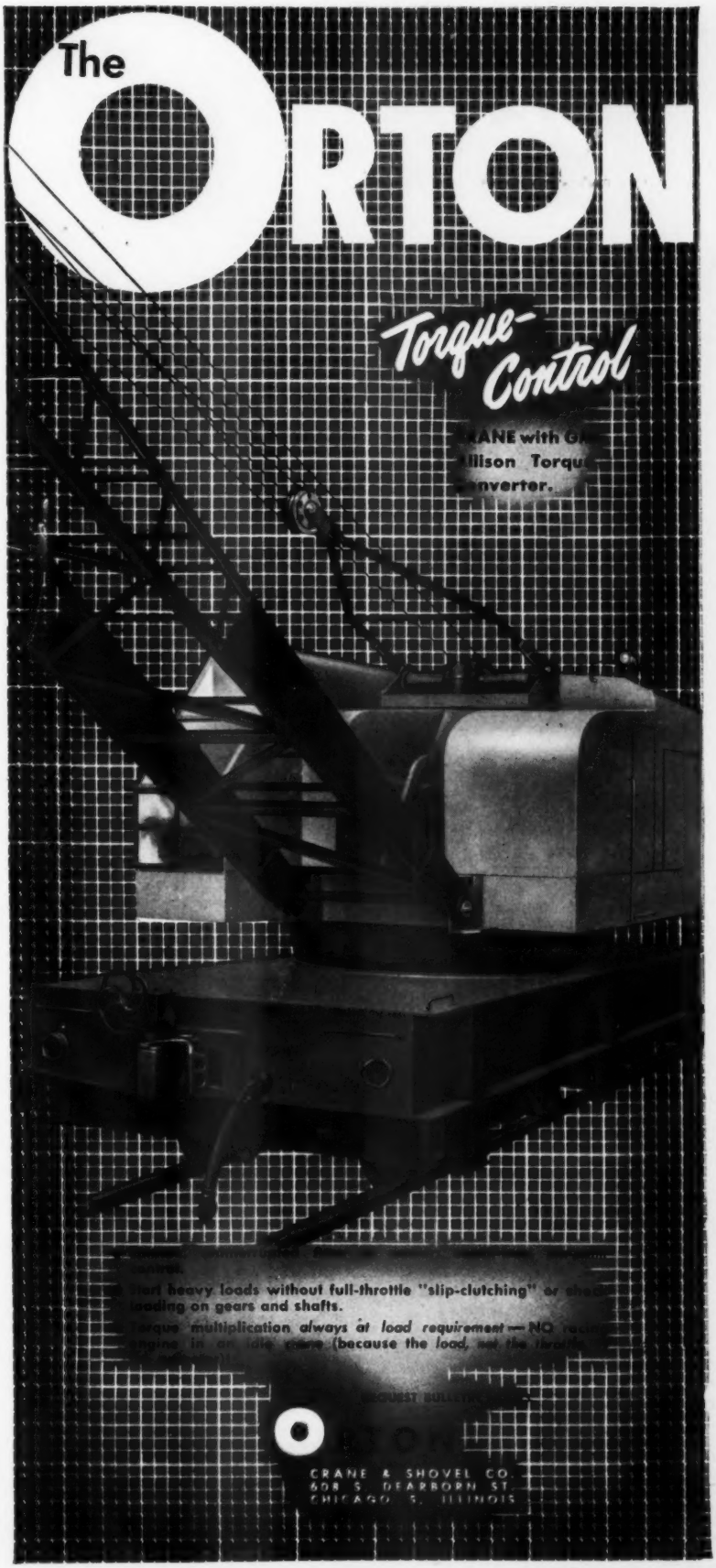
Mr. Kimball, who was born at Danvers, Mass., on August 8, 1887, began his railroad career with the Illinois Central at Chicago in 1904, holding various positions in the engineering department and advancing to chief draftsman for the engineer of buildings. In August 1918 he left the service of the IC to become engineer of buildings on the Western region of the B&O at Cincinnati, Ohio, and the

Otis G. Wilbur

following year was transferred to Baltimore, becoming engineer of buildings of the Eastern region. On March 1, 1920, his jurisdiction was extended over the entire B&O System.

Mr. Wilbur, a native of Baltimore, began working in the engineering depart-

(*Continued on page* 1116)



New Light Weight POWER FOR FASTER TRACK WORK

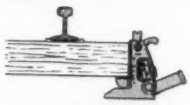
Aluminum Alloy

Simplex No. A5

UNIVERSAL TRACK JACK

Speeds

TAMPING—BALLASTING



SURFACING

LINING

Greater portability—weighs only 28 lbs. —with no sacrifice of strength, makes this jack a "must" for maintenance-of-way crews doing more work faster. Simplex No. A5 has 15 tons capacity, large forged toe lift surface of 2½" x 3¼". Simplex-engineered, aluminum alloy housing, reinforced at stress points, has the strength of malleable jacks weighing 45% more!

• SIMPLEX A17 TRACK JACK

Aluminum Alloy Housing—41½ lbs. Light—15 Tons Strong!

For general track jacking. Built with 40% extra support at stress points to equal strength of malleable jacks that are 45% heavier! Large toe lift area (2½" x 3¼") permits jacking under ends of ties without damage. Shorter fulcrum center. Safety thumbguard. Lifts full capacity on cap or toe! Height 22¾" with 13" lift.

SIMPLEX RAIL EXPANDERS

One man with No. 550 replaces rail pounding crew. Avoids battered rail ends, bolts or crossings. Easy to operate. 25 tons capacity. (Also available in two other models of 15 and 30 tons capacity.)

SIMPLEX SAFETY JACK SUPPORTS

Made of aluminum alloy. Only four needed to handle safely the heaviest structure. Far stronger than wooden wedges. Use as shown or inverted with Simplex Standard Speed Journal or Bridge Jacks.

Simplex LEVER • SCREW • HYDRAULIC Jacks

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Railway Personnel (Cont'd)

ment of the B&O in 1911 after being graduated from Baltimore Polytechnic Institute. He became assistant engineer of buildings in 1948.

Mr. Clark, born in Gloversville, N. Y., received the degree of Bachelor of Science in civil engineering from Union College in 1921. Two years later he entered the engineering department of the B&O, and in 1940 was appointed designing engineer in the bridge department.

Abram Clark

Mr. Dayett, who was born in Wilmington, Del., received his civil engineering degree from Lehigh University in 1909. He entered railway service in the engineering department of the B&O in 1922 after serving as a designing engineer for the American Bridge Company. He was appointed assistant engineer of bridges in 1940.

Track

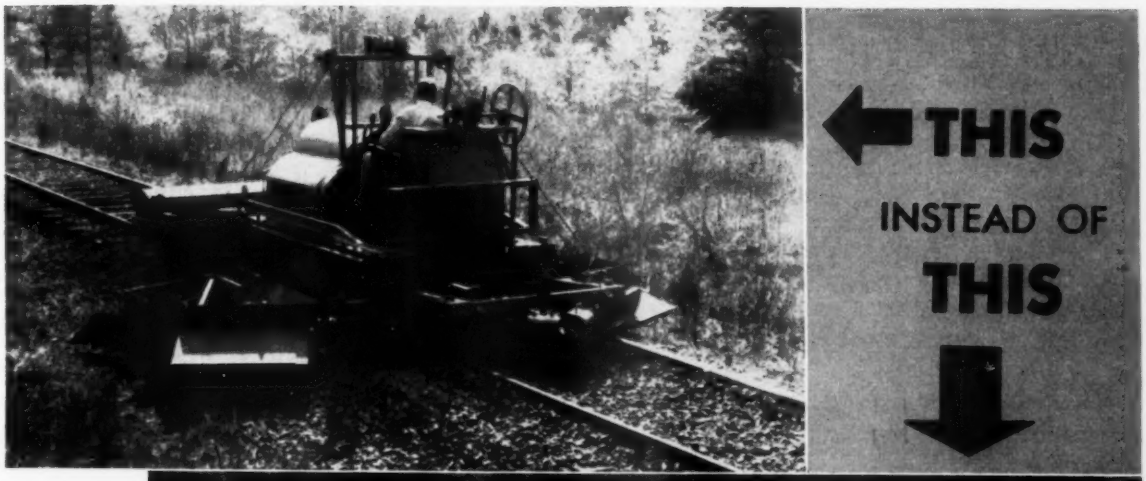
William E. Carnes, supervisor of track on the New York Central at Richland, N. Y., retired recently after more than 36 years of service.

T. I. Gibson has been appointed assistant roadmaster on the Montreal Terminals division, with headquarters at Montreal, to succeed **I. S. Robinson**, promoted.

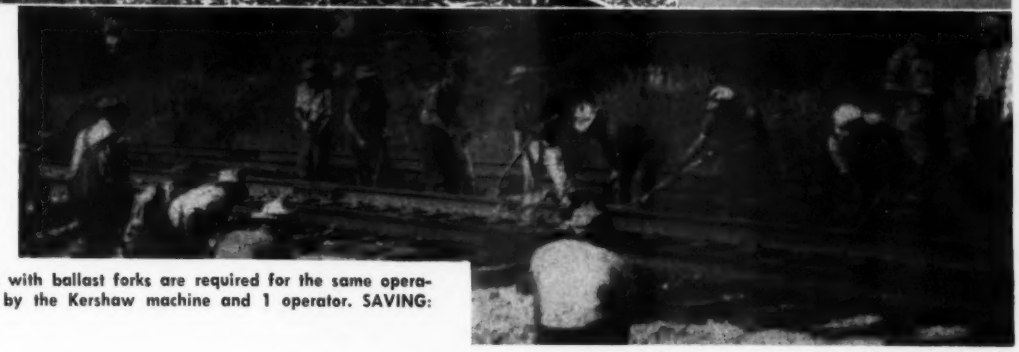
Thomas Burrell, Jr., assistant supervisor of track on the New York Central at Albany, N. Y., has been promoted to

(*Continued on page* 1118)

YOUR TRACK MAINTENANCE COSTS REDUCED BY KERSHAW BALLAST MACHINE



Above: Kershaw Ballast Regulator pulling in ballast from shoulder, plowing over rail, filling empty cribs, regulating and distributing ballast.



Below: 16 men with ballast forks are required for the same operation completed by the Kershaw machine and 1 operator. SAVING: 15 MEN!

The Kershaw Track Patrol is operated by two men and is provided with a turntable, permitting removal from the track at any road crossing or motor car set-off. The machine is used with out-of-face surfacing gangs, and as a track patrol to scarify, de-weed, regulate, and shape the ballast shoulder.

With surfacing gangs, it is used to regulate and distribute the ballast after unloading, and ahead of the surfacing gang. After surfacing is completed, the machine is used to regulate and shape the ballast slope, eliminating the entire regulating and dressing crew normally used in surfacing gangs.

The machine is also used with retimbering gangs to plow and spread the ballast from the tie ends.

On normal maintenance work, the machine may be assigned to a 200-mile section of track, and with the two operators, 2 to 3 miles of scarifying, regulating, de-weeding, and shaping of ballast is completed every day. On the 200-mile section, the machine will work this track two to three times yearly.

1. REPLACING TIES, savings 20¢ to 40¢ each. All ballast may be plowed from tie ends.

2. SURFACING TRACK, savings of $400.00 to $600.00 per mile. All ballast is regulated before surfacing; empty tie cribs are filled.

3. REGULATING BALLAST, savings of $200.00 to $400.00 per mile. Ballast dollies, dumps and hand labor are eliminated.

4. RECLAIMING BALLAST, savings of 50 to 100 cubic yards per mile per year. Ballast beyond toe line is reclaimed and returned to tie heads.

5. SCARIFYING BALLAST: The Track Patrol will periodically scarify ballast on 200 miles of track yearly.

6. BALLAST DE-WEEDING AND DRAINAGE: For less than $40.00 per mile per year, all ballast shoulders may be scarified, de-weeded, regulated, and shaped by the Kershaw Track Patrol.

7. CLEANING BALLAST: All foul ballast is scarified and plowed from a depth of 2" to 4" below ties. After several rains, the washed ballast is returned to the tie heads. This operation costs less than $50.00 per mile, as compared to a cost of approximately $500.00 per mile using present methods.

Write for free copy of "Track-Talk Magazine."

KERSHAW MANUFACTURING CO. INC., P.O. Box 510, Montgomery, Alabama

Railway Personnel (Cont'd)

supervisor of track at Corning, N. Y., to succeed **C. A. Ford,** who has been transferred to Hudson, N. Y. **W. J. Bergamo,** assistant supervisor of track at Fonda, N. Y., has been transferred to Albany to replace Mr. Burrell, and **W. J. Rigney,** transitman on the engineering corps at Poughkeepsie, N. Y., has been advanced to assistant supervisor of track at Fonda to succeed Mr. Bergamo.

C. M. Nobel, who has been appointed supervisor of track on the Pennsylvania at Monongahela, Pa., as announced recently (RE&M, September, p. 914), was born at Midway, Pa., on November 5, 1905. Entering the employ of the Pennsylvania on January 17, 1923, as a laborer at Carnegie, Pa., he subsequently served as assistant track foreman and track foreman at that location. In 1939 he was appointed general foreman at Wellsville, Ohio, and on March 1, 1949, was advanced to assistant supervisor of track at Conway, Pa., Mr. Noble was serving in the latter capacity when he received his recent promotion.

E. A. Stewart, assistant supervisor of track on the Boston & Maine at Dover, N. H., has been promoted to supervisor of track at Fitchburg, Mass., to succeed **F. A. Mason,** deceased. **Leonce Plante,** construction supervisor on the Portland division, has been appointed assistant supervisor of track at Dover to replace Mr. Stewart. **F. G. Baker, Jr.,** supervisor of track at Greenfield, Mass., has been transferred to Portsmouth, N. H., to succeed **M. E. Leavitt,** who has had a re-assignment. **Benedetto De Matteo,** assistant supervisor of track at Concord, N. H., has been promoted to supervisor of track at Westboro, N. H., to replace **W. S. Cooper,** who has been transferred to Greenfield to succeed Mr. Baker.

C. W. Owens, assistant supervisor of track on the Maryland division of the Pennsylvania, has been promoted to supervisor of track on the Cincinnati division succeeding **J. G. Wilson,** and **M. I. Stone,** supervisor of track on the Pennsylvania-Reading Seashore Lines, has been transferred to the Cincinnati division succeeding **W. G. Goellner,** resigned. **J. E. Radcliffe,** assistant supervisor of track on the Panhandle division, has been promoted to supervisor of track on the Fort Wayne division, succeeding **W. B. Super. P. A. Mainquist,** supervisor of track on the New York division, has been transferred to the Southwestern division, succeeding **E. J. Sierleja,** and **W. S. Titlow,** supervisor of track on the Philadelphia Terminal division, has been transferred to the Southwestern division, succeeding **R. V. Young.**

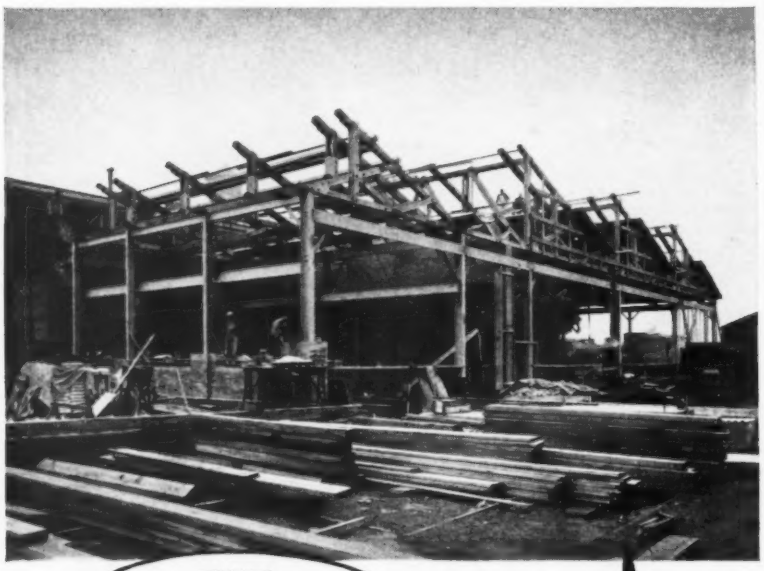
Thomas L. Biggar, assistant cost engineer on the Chesapeake & Ohio, has been appointed supervisor of track at Covington, Ky., to succeed **John C. Runyon,** who has retired.

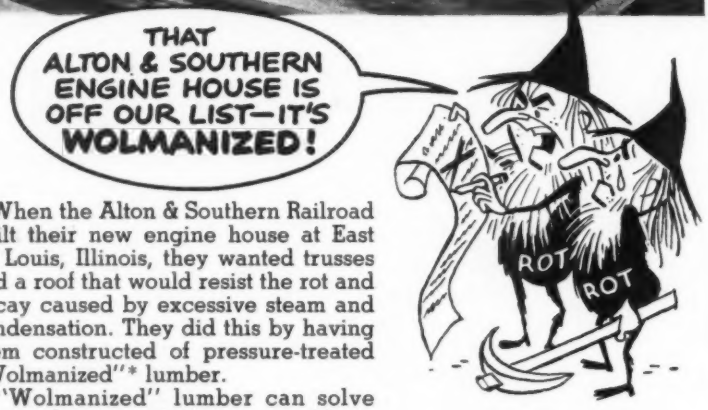
Martin L. Denton, Jr., section foreman on the Southern at Keysville, Va., has been advanced to assistant supervisor of track at Richmond, Va.; **Clarence O. Barksdale,** extra gang foreman, has been appointed assistant supervisor of track at Keysville, Va.; and **Herbert A. Sullivan,** section foreman, has been appointed assistant supervisor of track at New Albany, Ind.

C. H. Davis, Jr., Junior engineer on the Maryland division of the Pennsylvania, has been promoted to assistant supervisor of track at Aspinwall, Pa., to succeed **J. A. Myers,** who has been transferred to Canton, Ohio. **E. L. Clausing,** supervisor of track at Logansport, Ind., has been transferred to Olean, N. Y. **D. A. Sempsrott,** supervisor of track on the Fort Wayne division, has been transferred to the Maryland division at Washington, D. C.

M. E. Nyberg, roadmaster on the Northern Pacific at Peasco, Wash., has been promoted to district roadmaster at Yakima, Wash., succeeding **G. K. Lamphier,** who has been transferred to Spokane, Wash. Mr. Lamphier succeeds **M. L. Frederick,** who has been appointed division roadmaster at Spokane succeeding **A. D. Zanger,** who has retired after 50 years of continuous service. **R. E. Hom** has been appointed roadmaster at Pasco succeeding Mr. Nyberg.

Ernie W. Potter, whose appointment as supervisor of track on the Southern at Danville, Ky., was recently announced (RE&M, September, p. 914), was born at Lancing, Tenn., on December 15, 1906. He was first employed by the railway as an extra gang laborer on the Cincinnati,





• When the Alton & Southern Railroad built their new engine house at East St. Louis, Illinois, they wanted trusses and a roof that would resist the rot and decay caused by excessive steam and condensation. They did this by having them constructed of pressure-treated "Wolmanized"* lumber.

"Wolmanized" lumber can solve many of your maintenance problems caused by moisture and heat. It is clean, odorless, paintable, non-leaching. There are Wolman preservative plants in all parts of the country. For further information, write:

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New Orleans & Texas Pacific in July 22, and served later as assistant extra gang foreman. In January 1928 he was appointed section foreman at Oakdale, Tenn., the position he held just prior to his recent promotion.

John I. Vardaman, whose appointment as supervisor of track on the Southern at Oxford, Ala., was announced recently (RE&M, September, p. 914), was born at Childersburg, Ala., on June 16, 1898. Entering the employ of the railway in February 1921 as a section laborer on the Mobile division, he later served as assistant foreman, relief section foreman, section foreman and diesel shovel helper and operator on that division. Mr. Vardaman was appointed section foreman at Burnsville, Ala., in February 1942, which position he held just prior to his recent promotion.

Bridge and Building

S. G. Wintoniak, formerly assistant supervisor of structures on the Philadelphia Terminal division of the Pennsylvania, who has returned from military service, has been appointed supervisor of structures on the Middle division.

Obituary

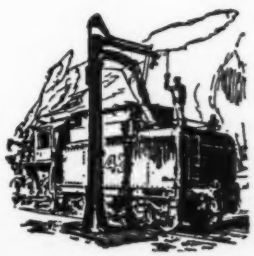
E. F. Wendt, consulting engineer and former assistant chief engineer of the Pittsburgh & Lake Erie died recently. Mr. Wendt served in 1913 and 1914 as president of the American Railway Engineering Association.

Association News

American Railway Engineering Association

The Committee on Rail has tentatively scheduled a meeting to be held in New York on November 20. The Board of Direction of the association will hold its regular fall meeting at the Palmer House, Chicago, on November 7, concurrent with the meeting of the Nominating committee to be held at association headquarters, Room 1218, on the same date. The General Convention Arrangements com-

(*Continued on page* 1120)



You Get Many More Man-Hours for Track Maintenance

When **BORASCU®** **WEED KILLER** *Is Put To Work!*

Roads using BORASCU to destroy weeds and grasses get a bonus in valuable man-hours! *Their* extra gangs now do track work instead of "grassing" all summer long. BORASCU Weed Killer effectively destroys vegetation for long periods when properly applied; it is especially useful about trestles, tie-piles, signal blocks, small switch yards and other places where spraying with large train equipment is not feasible. Users prove BORASCU is nonpoisonous, nonflammable and noncorrosive to ferroalloys. Applying BORASCU is simple and economical...

Just a Pail... a Man... and **BORASCU WEED KILLER**

Weed Control Representatives located in: AMARILLO, FT. WORTH and HOUSTON, TEX. • AUBURN, ALA. • NEW YORK CITY • PHILADELPHIA • CHICAGO • CLEVELAND • DENVER KANSAS CITY, MO. • MINNEAPOLIS, MINN. • POCATELLO, IDAHO • PORTLAND, ORE. SAN FRANCISCO *Home Office:* 630 SHATTO PLACE, LOS ANGELES 5, CALIFORNIA

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LARGE or SMALL . . .

BURRO DOES EVERY JOB EFFICIENTLY, ECONOMICALLY

Whether the Burro is used to speed track laying or relocation, for bridge building, earth or ballast handling or on locomotive coaling jobs, it will handle every job more efficiently and economically—because Burro Cranes are built for railroad work.

Only **BURRO** *cranes have:*

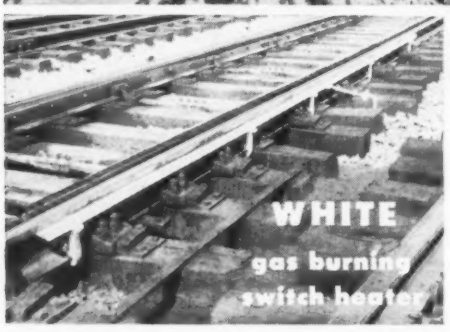
- *Fast travel speeds—up to 22 M.P.H.*
- *Draw Bar Pull of 7500 lbs. (often eliminates need for work train or locomotive).*
- *Elevated Boom Heels for working over high sided gondolas.*
- *Short tail swing—will not foul adjoining track.*
- *Low overall height—Burro can be loaded and worked on a standard flat car (See illustration).*

Write for Bulletins

CULLEN-FRIESTEDT CO., **1301 S. Kilbourn Ave.,** **Chicago 23, Illinois**

CULLEN-FRIESTEDT CO., CHICAGO 23, ILL.

Winter-proof your switches



A recent survey of all switch heaters, by a prominent railroad showed

WHITE Switch Heaters

lowest **in initial price;**
in installation expense;
in operating cost; AND
highest **in popularity.**

Automatic Control for Remote Switches

Write for new circular

White Manufacturing Company

ELKHART 27 INDIANA

E. R. Mason, New York; John A. Roche, Chicago; L. A. Gardner Ada, Okla.; Wm. H. Ziegler Co., Minneapolis

Association News (Cont'd)

mitte will meet at association headquarters, Room 1218, on November 6.

The secretary's office has appealed to the chairmen, vice-chairmen, and subcommittee chairmen of all AREA committees to submit their reports on schedule, to the prescribed standards, and accompanied, if necessary, by illustrations suitable for reproduction. Failure to do so, the secretary's office points out, may lead to the disruption of the association's printing and mailing schedule.

Additional copies of the 1952 Manual Supplement can be purchased from the secretary's office at a price of $1.50 each. In addition, the 1952 Supplement to the Portfolio of Trackwork Plans is now available and may be purchased from the secretary's office at a cost of $2.00.

Bridge and Building Association

Activities of the association looking to the 1953 convention will get under way on December 8 when the Executive committee, under the direction of president

Meetings and Conventions

American Railway Bridge and Building Association—Annual meeting, September 15-17, 1953, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

American Railway Engineering Association—Annual Meeting, March 17-19, 1953, Chicago. Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association—Annual meeting, April 28, 1953, Cleveland Hotel, Cleveland, Ohio. W. A. Penrose, Secretary-treasurer, 839 Seventeenth street, N. W., Washington 6, D. C.

Bridge and Building Supply Association—L. R. Gurley, Secretary, 201 North Wells street, Chicago 6.

Maintenance of Way Club of Chicago—Next meeting November 24. E. C. Patterson, Secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club—Secretary, 30 Church street, New York.

National Railway Appliances Association—J. B. Templeton, Secretary, 1020 So. Central avenue, Chicago 44; Lewis Thomas, Assistant Secretary, 59 East Van Buren street, Chicago 5.

Railway Tie Association—Roy M. Edmonds, Secretary-treasurer, 1221 Locust Street, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Annual meeting, September 15-17, 1953, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

Track Supply Association—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago 5.

F. R. Spofford, will hold a meeting at the St. Charles hotel, New Orleans, La. While routine business will be discussed, the principal activity will be the selection of committees for preparing reports on the seven subjects that have been chosen for investigation during the year.

Maintenance-of-Way Club of Chicago

The first meeting of the current season was held at Eitel's restaurant, Chicago, on October 27. Professor W. E. Loomis of the Iowa State College department of Botany and Plant Pathology presented an interesting address on Control of Roadbed Vegetation. His remarks were based on the results of a weed-control research project, which he heads, now being conducted under a cooperative agreement between Engineering Division, AAR, and the Iowa Agricultural Experiment Station. Professor Loomis' address was illustrated with color slides.

Supply Trade News

General

Templeton, Kenly & Company, Chicago, has announced the consolidation of its New York domestic and export offices. **E. A. Zimmerman,** manager of New York domestic sales will direct both operations from new headquarters located at 60 E. 42nd St., New York.

Personal

E. D. Tull has been named to the newly created position of vice-president and general manager of **Cummins Engine Company, Inc.,** Columbus, Ind. A native of Columbus, Mr. Tull has been

E. D. Tull

with the company since 1928. In February of this year he was named vice-president of personnel and plant, and was recently elected to the company's

(*Continued on page* 1122)

Duff-Norton TRACK JACKS

Yes, the interchangeability of parts is another outstanding reason why Duff-Norton Track Jacks are so popular among track maintenance men. Only a minimum of spare parts is needed for all jacks in service. This, coupled with "built-in" dependability, makes Duff-Norton jacks unexcelled for all track surfacing, lining and tamping operations.

Write for Bulletin AD-18 Q.

THE **DUFF-NORTON** MANUFACTURING CO.
MAIN PLANT and GENERAL OFFICES, PITTSBURGH 30, PA.—CANADIAN PLANT, TORONTO 6, ONT.
"The House that Jacks Built"

Supply Trade News (Cont'd)

board of directors. In his new position he will be responsible for coordinating the work of the five divisions of the company.

Alex Oleair, manager of customer service for the transportation industries division of **Nelson Stud Welding** division of **Gregory Industries, Inc.,** Lorain, Ohio, has been appointed field engineer of a new office recently opened at Norfolk, Va., to service firms now using stud welding in the states of Virginia and North Carolina.

E. M. Webb, vice-president and general manager of the **Duff-Norton Manufacturing Company,** Pittsburgh, Pa., has been elected a member of the board of directors of the company.

Miles D. Catton, director of development of the **Portland Cement Association,** Chicago, has been appointed assistant to the vice-president for research and development, succeeding **H. F. Gonnerman,** who was retired after 30 years of active service with the association.

C. B. Foster has been appointed to the newly created position of sales manager—engines, for the **Cummins Engine Company, Inc.,** Columbus, Ind. Mr. Foster, who graduated from Purdue University in 1926 with the degree of Bachelor of Science in chemical engineering, served as assistant to the vice-president in charge of sales of the Bucyrus-Erie Company and assistant to the operating vice-president of the Truax-Traer Coal Company, before joining Cummins in 1950 as national accounts representative at Chicago. He later moved his headquarters to Columbus and, in 1951, was appointed manager-contract

C. B. Foster

sales, which position he held prior to his recent promotion. In this new capacity, Mr. Foster will continue to be in charge of all government contract work and, in addition, will take over the duties of the former position of manager-engine sales.

Robert L. Holt has been appointed vice-president of **Bowser, Inc.,** Ft. Wayne, Ind., and **Franklin Fickett** has been named manager of the Railroad Sales division.

Mr. Holt was born October 10, 1901, and graduated from Syracuse University in 1924. Upon graduation from college he became associated with the Credit Guide Company, Chicago, as secretary and remained in that position for five years before becoming vice-president of the A. C. Allyn Company, Chicago. He became associated with the Army Ordnance Department in May 1942, and

***R. H. Hill* recenty appointed assistant general manager of transportation sales for the *Sherwin-Williams Company,* Cleveland, Ohio. Mr. Hill will continue to act as manager of the Atlantic Coast transportation zone.**

Announcing an Important New Fire Resistant Product for Railway Application

POSITIVE FIRE PROTECTION

for Vertical Members and Supports of Railroad Bridges, Trestles and other Structures

ZONE FIREPLATE Patent Pending

Now . . . from the company that developed the famous Libbey-Zone fire resistant process —comes a completely new product—FIREPLATE. This new product is scientifically correct and thoroughly field tested and proved. FIREPLATE serves a dual purpose: 1) provides exceptional protection against drying, rotting and deterioration and 2) assures almost perfect protection against fire damage.

Even when subjected to extremes of heat, FIREPLATE remains stable . . . will not liquify or run. Equally important, FIREPLATE is not subject to deterioration . . . the original application is all that is ever needed.

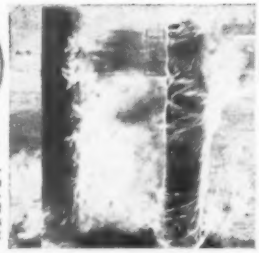
These photos, reproduced below, taken on March 28, 1952, during a typical FIREPLATE field test, show conclusively the ability of this remarkable new product development to resist fire damage.

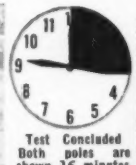
You are invited to get the complete facts about FIREPLATE. Let us arrange a demonstration . . . or send you sufficient FIREPLATE to conduct your own tests if you prefer. Write without obligation.

Start of the Test
The pole at the left is treated with FIREPLATE: the other pole is treated with a conventional protective coating. Both have been previously creosoted.

"Like a Brush Fire"
Within three minutes after the start of the fire, flames are lapping eagerly at the bases of the two poles.

The Test Takes Shape
Seven minutes after the start of the test the FIREPLATE treated pole clearly shows its ability to resist fire.





Test Concluded
Both poles are shown 16 minutes after the start of the test. The FIREPLATE treatment has prevented any traceable damage to the left pole.

FIREPLATE (Pat. Pending) IS OUR EXCLUSIVE DEVELOPMENT MADE AND SOLD ONLY BY

THE ZONE COMPANY Division of the Southwestern Petroleum Company, Box 789, Ft. Worth, Tex.

upon separation from the army with the rank of lieutenant colonel in December 1945, re-entered the field of investment banking. Mr. Holt served as vice-president of Blair, Rollins & Co., Inc., Chicago, and as vice-president of H. M. Byllesby & Co., also of Chicago, prior to joining Bowser. Mr. Holt has been a

Robert L. Holt

member of the Bowser board of directors for the past two and one-half years, and a member of the finance committee for the past year and one-half.

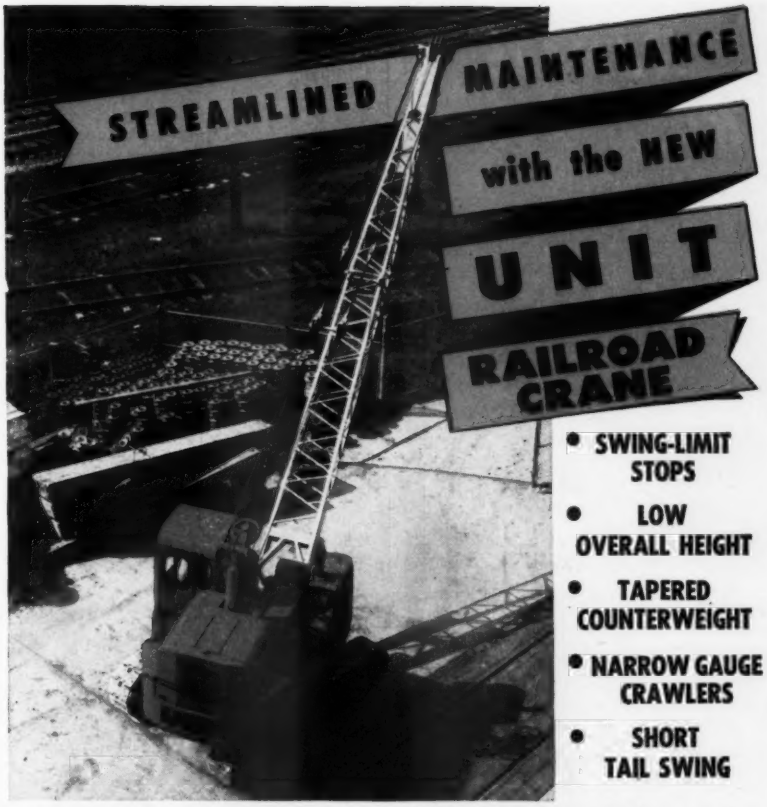
Mr. Fickett, a graduate of Pratt Institute gained his early railroad experience with the New York, New Haven & Hartford as an apprentice machinist in the mechanical department. From September 1942 until August 1946, he served with the U. S. Railroad Battalion doing maintenance work on diesel locomotives. Upon separation from the army as a first

Franklin Fickett

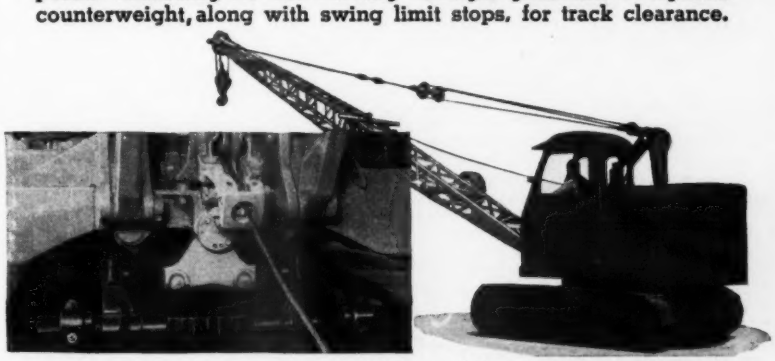
lieutenant, he became associated with the railroad division of Fairbanks, Morse & Co. as a service engineer of diesel locomotives. Prior to joining the Bowser organization, Mr. Fickett was associated with the Hunt Spiller Manufacturing Company, Boston, Mass., as a sales representative of locomotive replacement parts.

Eugene E. Dailey has been appointed district sales manager of the **Ramapo Ajax** division of the **American Brake Shoe**

(*Continued on page* 1124)



Many of the features found in the UNIT 1020R were built around the ideas and suggestions of railroad engineering specialists. Its modern design assures fast, easy control, both in crane and excavator operation . . . on the line, or off-the-track. A low overall height allows for underpass clearance. Narrow gauge crawlers permit unloading in, and moving through, gondolas. A tapered counterweight, along with swing limit stops, for track clearance.



Swing-Limit Stops act as automatic guides where space does not permit a full swing. Eight cushioned stops offer a selection of working ranges within safe operating limits. Prevents fouling the adjoining track, or striking obstacles when working in confined quarters.

With a reputation for high production and economical operation, the UNIT 1020R is a machine you'll want to know more about . . . Write for complete details regarding specifications and working ranges.

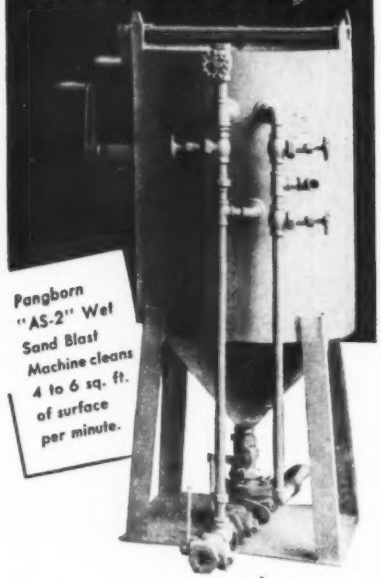
UNIT CRANE & SHOVEL CORP. 6403 W. Burnham St., Milwaukee 14, Wis., U.S.A.

SHOVELS • DRAGLINES • CLAMSHELLS
CRANES • TRENCHOES • MAGNETS

REMOVE RUST, SCALE

from Water Tanks, Bridges, Towers, Steel Freight and Tank Cars

FASTER AND CHEAPER



Pangborn "AS-2" Wet Sand Blast Machine cleans 4 to 6 sq. ft. of surface per minute.

PANGBORN'S AS-2 Machine is designed for economical, efficient, outdoor use of wet sand blasting—blast cleaning with a mixture of sand and water! It's inexpensive, practical, test-proven and has these advantages:

Provides continuous operation—only necessary to maintain sufficient abrasive supply. *Portable*—with or without two-wheel truck mounting. In addition, tanks are provided with two eye bolts for crane hooks. *Can be used in rainy weather*—unlike dry sand blasting. *Saves money*—eliminates expense of drying sand after purchase; cleans faster and more thoroughly on most surfaces. *Permits use of rust inhibitor*—chemical solutions can be used as an integral part of the cleaning process. *Provides dust-free operation*—prevents damage to nearby machinery and buildings; entirely eliminates need for ventilating systems.

LEARN HOW YOU can speed up cleaning and save money at the same time. Write today (at no obligation) for Bulletin No. 116. PANGBORN CORP., 4000 Pangborn Blvd., Hagerstown, Maryland.

Look to Pangborn for the latest developments in Blast Cleaning and Dust Control equipment

Pangborn

BLAST CLEANS CHEAPER

with the right equipment for every job

Supply Trade News (Cont'd)

Company at Cleveland, Ohio. Mr. Dailey, who received his higher education at the Illinois Institute of Technology, joined American Brake Shoe as an apprentice in 1941 and went into sales in 1947.

James D. Rolando has been appointed to the sales department of the **Brainard Steel** division of the **Sharon Steel Corporation**, Sharon, Pa. Mr. Rolando, who was formerly associated with the Wean Engineering Company, Warren, Ohio, will handle the sale of anti-checking irons and Brainard tie-handling systems to railroads throughout the country.

Robert G. Caldwell has been appointed district manager of the Atlanta, Ga., branch office of the **Gardner-Denver Company**, Quincy, Ill. He succeeds **H. G. Little**, who resigned upon buying an interest in the Central Machinery Company, Miami, Fla., a Gardner-Denver distributor.

Robert G. Caldwell

Mr. Caldwell, a graduate of Northwestern University, has been associated with Gardner-Denver for the past 12 years, 10 years as a salesman at Houston, Tex., and for the past 2 years as resident salesman with headquarters at Corpus Christi, Tex.

Trade Publications

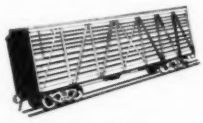
To obtain copies of any of the publications mentioned in these columns, use postcards, page 1072.

Rust Preventive—Pictures tell the story in a new industrial folder on the roller method of coating wire-fences, recently issued by the Rust-Oleum Corporation. The folder contains nine on-the-job photographs which show the step-by-step procedure of how to apply coating materials to fences.

Tractors—A new 8-page, 2-color booklet entitled "High Production with the Cat DW 20," has recently been issued by the Caterpillar Tractor Company. In this booklet, the reader is taken across the continent to visit large-scale construction, mine and quarry jobs. The earthmoving rigs of well-known equipment users are pictured and include, in addition to the

Penta Gives CLEAN Protection

FOR ALL WOOD CONSTRUCTION



. . . . car lumber

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The surest way to multiply the life of wood many times over . . . hold down maintenance expenses . . . stop decay and termites . . . is the PENTA way. PENTAchlorophenol is clean and paintable, doesn't evaporate or wash away, is always the same—but costs no more than other types of wood preservatives. Write today for complete facts and names of companies supplying PENTA-treated forest products.

CHAPMAN CHEMICAL COMPANY

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CHAPMAN®

Penta Preservative

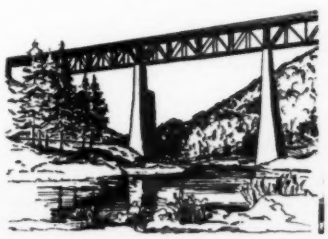
Conforming to
A. W. P. A. Specifications P8 and P9

DW 20 tractor, the Caterpillar W20 wagon, No. 20 scraper, and the Athey PD20Q trailer.

Spreaders-Ditchers-Plows—The O. F. Jordan Company has recently issued a new 18-page, 2-color booklet, which describes the Jordan line of spreaders, ditchers, and snowplows. On-the-job photographs are included of all models along with specifications for the Models 2-150, 3-215 and 2-215 spreaders, Models 2-180, 3-200, 3-211 and 2-220 spreader-ditchers, and the Models 2-200, 3-175, 3-210 and 2-225 spreader-ditcher-snowplows. Constructional photographs illustrate the design features found in all Jordan equipment.

Off-Track Maintenance—A new off-track maintenance booklet designated as Form 30506 and entitled "Mechanize Off-Track Maintenance," has recently been published by the Caterpillar Tractor Company. Maintenance techniques and equipment used by railroads across the country are presented in the 8-page, 2-color booklet. Illustrations show the work done by tractors equipped with bulldozers, scrapers, front-end loaders and crane attachments. Motor grader uses in off-track maintenance are also included. The applications of tractors equipped with special "shoes" for work both on and off the track are given. Attention is directed to the general advantage of mechanizing which are listed as doing faster work, avoiding unnecessary drains on available labor, minimizing the use of work trains, preventing interference to traffic and keeping costs to a minimum.

Wrought Iron Pipe and Plate—to help engineers serving the railroad industry in their design and specification work, the A. M. Byers Company, has prepared a four-page bulletin containing the most frequently required data on wrought iron pipe and plate. Size and dimensional data for both standard weight and extra strong pipe are listed in consolidated tables. The listings include size, interior and exterior diameters, thickness, weight per foot, threads per inch, mill-test pressures, transverse areas and circumference, length per square foot of surface area, external area per lineal foot, length per cubic foot of volume, gallons per lineal foot and weight of water per lineal foot of pipe length. Diameters and lengths of couplings are also shown along with data on size, shape and thickness of wrought iron forging billets. A portion of the reference piece gives a breakdown of standard applications of wrought iron in the railroad industry with a brief description of some specific uses.



SPEED UP Small Grinding Jobs

with the Mall

2 Hp. Signal Bond GRINDER

Now, *take on* those grinding jobs that don't require "big power" . . . with this Mall 2 hp. Signal Bond Grinder. Easily and economically handle such grinding jobs as cleaning rail heads before the installation of welded type signal bonds. Peak-performing 4-cycle 2 hp. engine mounts outrigger for easy down-track travel . . . or lightweight base that swivels 360°. One man carries unit without tiring. Stand-the-gaff flexible shaft also mounts attachments for sanding, wire brushing, vibrating concrete, etc. **Write for catalog No. 50.**

4-cycle 2 hp. engine unit, on 360° swivel base with shaft and vibrator.

40 Factory-Owned Service Warehouses, Coast to Coast, To Serve Our Customers and Thousands of Dealers.

Mall TOOL COMPANY

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Clip and mail this CHECK LIST for details

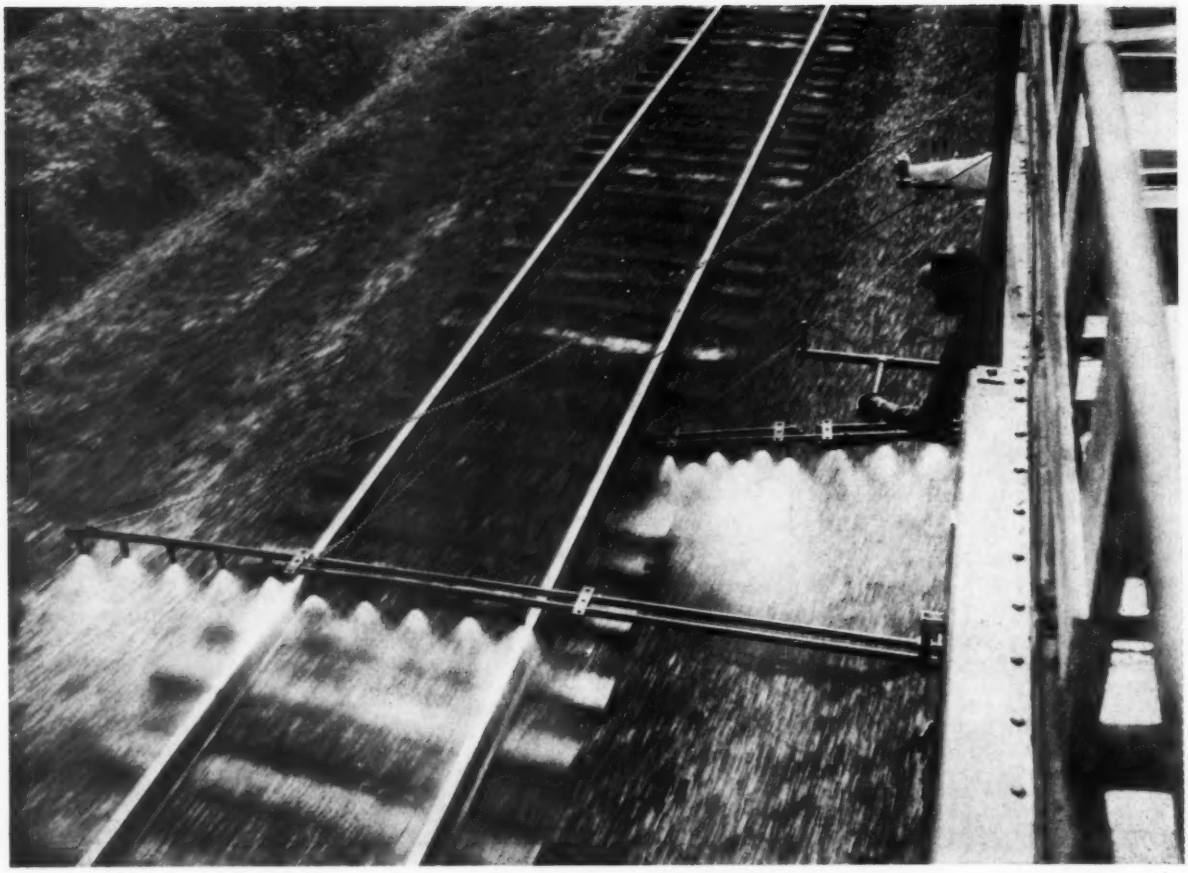
Only the GRAVELY does so many Jobs so well!

One powerful 5-HP Gravely Tractor offers a choice of 20 tools! . . . Does off-track moving, platform sweeping, snow removal, lawn mowing. All grounds maintenance handwork is done with POWER — *faster, better!*

One Gravely Tractor with the proper attachments will make one man as effective as eight!

All-gear drive, power reverse. Works on steep slopes, rough ground. Railroad-tested for 31 years. Free Booklet, "Power vs Drudgery" tells how Gravely POWER frees your men for other work, increases efficiency, saves maintenance dollars. Write for it today!

Gravely Motor Plow & Cultivator Co.
BOX 1142 · DUNBAR, WEST VIRGINIA



Research Proved WEED KILLERS

. . . APPLIED WITH MODERN EQUIPMENT

Time and time again, BOGLE research has paid off in improved chemical track weeding at lower cost. Now we are equipped to do a better job than ever with newly-developed spraying equipment providing better, more closely controlled application.

BOGLE chemicals are *tested* herbicides which have been proved in "on track" field testing. We know what they can accomplish. We are ready and equipped to cooperate with you in any program of weed or brush killing, large or small.

THE R. H. BOGLE COMPANY

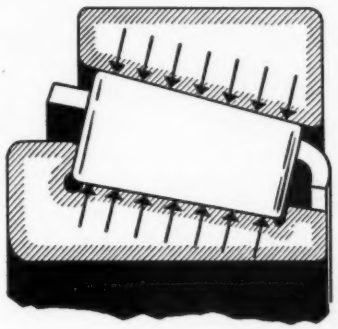
Complete Weed and Brush Killing Service

Atlanta, Ga. **ALEXANDRIA, VA.** **Memphis, Tenn.**

6 problems you can solve with TIMKEN® bearings

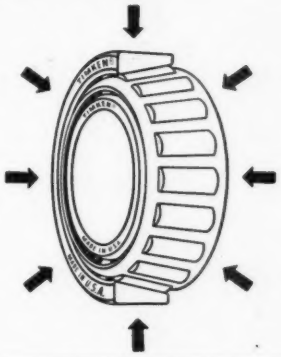
HEAVY LOADS

Loads carried on the rollers and races of Timken® bearings are spread evenly over a line of contact. The greater load area assures extra load-carrying capacity.



COMBINATION LOADS

Due to their tapered design, Timken bearings carry radial and thrust loads in any combination. No auxiliary thrust bearings or plates are needed.

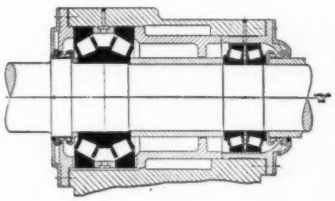


PRECISION

Timken bearings hold shafts in positive alignment, prevent end-movement, minimize deflection. Gears mesh precisely, assuring a smooth flow of power.

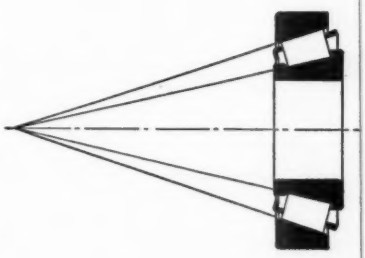
MAINTENANCE

Closures are more effective because Timken bearings keep housing and shaft concentric. Dirt and grit are kept out. Lubricants are kept in.



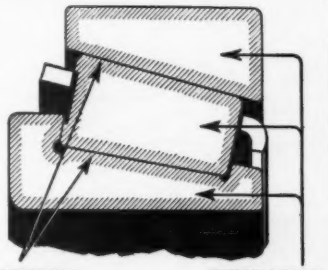
FRICTION

Timken bearings roll freely due to true rolling motion. Lines coincident with tapered surfaces of rollers and races meet at a common point on the bearing's axis.



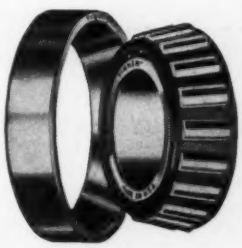
WEAR

Rollers and races of Timken bearings are made of Timken fine alloy steel — case hardened for a hard, wear-resistant surface and tough, shock-resisting core.



Be sure to specify Timken roller bearings for the machines you buy or build. Look for the trade-mark "TIMKEN" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

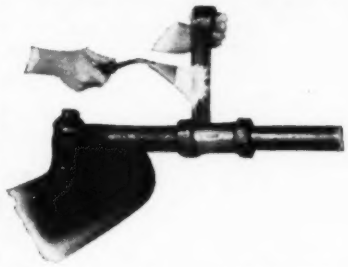
TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



NOT JUST A BALL — NOT JUST A ROLLER — THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST — LOADS OR ANY COMBINATION

More and more railroad maintenance men are depending on TAPECOAT to protect pipe joints and short pipe sections in underground service, at bridge crossings and wherever corrosion is a problem.

TAPECOAT is the coal tar protection in handy tape form. It comes in widths of 2, 3, 4, and 6 inches for spiral wrapping; and in widths of 18 and 24 inches for cigarette wrapping of large diameter pipe, tanks, etc.



Application is quick, easy, economical. Just a flash of a torch and TAPECOAT provides a perfect lasting bond to seal out the elements of corrosion.

TAPECOAT engineers have specialized in this protection for more than 10 years. Call on them to help you work out your individual requirements.

Write for full details

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Originators of the Coal Tar Tape for Pipe Joint Protection

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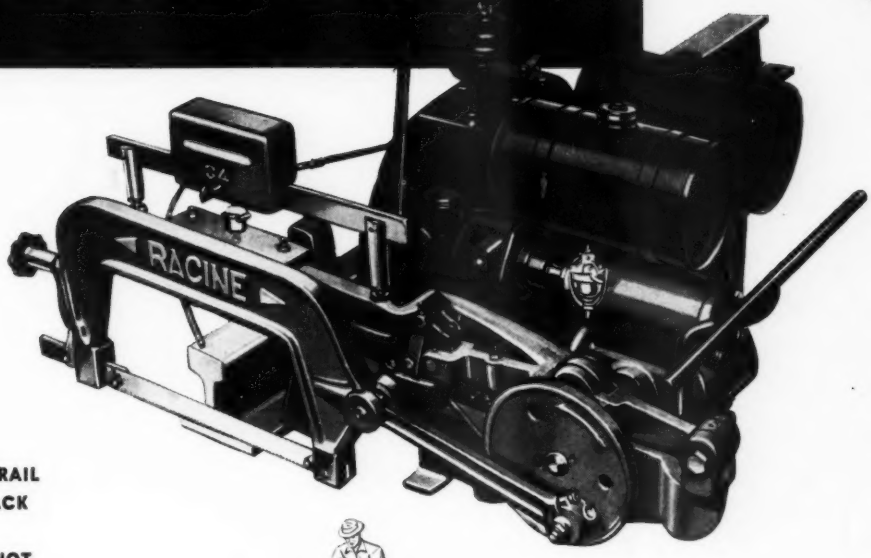
RACINE *Portable* RAIL SAW



- CROP RAIL IN TRACK
- WILL NOT SHATTER OR BURN RAIL ENDS
- CUT OFF ANY LENGTH DOWN TO 1/10"
- NO TRAFFIC INTERFERENCE

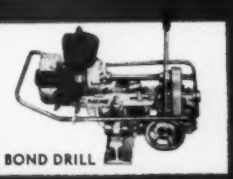
One man operates the RACINE Portable Rail Saw while it does the work of several hands. Designed specifically for cutting rail in track, it handles the job fast and dependably.

Cuts are smooth and accurate. Shattered and burned rail ends are eliminated. The possibility of rail failures from fractures that start with torch cutting or "nick and break" cropping is reduced.

Easily moved by two men, it does not hamper traffic. Operation is simple. Maintenance cost is low. Here is an "extra employee" you can rely upon for steady output under all conditions.

Write for new, 3-color catalog describing RACINE Railway Maintenance Machines.

OTHER RACINE PORTABLE MACHINES



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2038 Albert Street • Racine, Wis.

TRACK STABILITY LASTS

...when you use the Texaco Asphalt-Cement Method of Pressure Grouting

Leading railroads have proved that grouting is the most economical and satisfactory way to stabilize "soft track." And when the grouting mixture is fortified with just a small quantity of *Texaco No. 24 Emulsified Asphalt* even better results are assured.

Texaco No. 24 Emulsified Asphalt is made especially for grouting. It acts as a "lubricant" for the grout . . . enabling it to flow smoothly, penetrate and seal better. Furthermore, the pure asphalt helps the grout to waterproof the soil, keeping it resilient yet stable. First cost for this better method of grouting is low; and the resulting stability lasts indefinitely. Roadbed maintenance costs come down and stay down.

Texaco also offers two other track maintenance products that are real economies: *Texaco Rail Joint Lubrication* – either spray or grease type – to eliminate corrosion, kinks, freezing and pull-in-twos. *Texaco Asphalt* for coating ballast assures cleaner track, better drainage, more stability.

A Texaco representative will gladly give you complete information. Just call the nearest Railway Sales office in New York, Chicago, San Francisco, St. Paul, St. Louis or Atlanta; or write:

The Texas Company, *Railway Sales Department*, 135 East 42nd Street, New York 17, N. Y.

TEXACO Emulsified Asphalt FOR GROUTING

Faithfully yours 50 *for Fifty Years*

TUNE IN: Tuesday nights on television—the TEXACO STAR THEATER starring MILTON BERLE. See newspaper for time and station.